S. Hrg. 100-746

NATIONAL NUTRITION MONITORING AND RELATED RESEARCH ACT OF 1987

HEARINGS

BEFORE THE

COMMITTEE ON GOVERNMENTAL AFFAIRS UNITED STATES SENATE

ONE HUNDREDTH CONGRESS

SECOND SESSION

ON

S. 1081

TO ESTABLISH A COORDINATED NATIONAL NUTRITION MONITORING AND RELATED RESEARCH PROGRAM, AND A COMPREHENSIVE PLAN FOR THE ASSESSMENT OF THE NUTRITIONAL AND DIETARY STATUS OF THE UNITED STATES POPULATION AND THE NUTRITIONAL QUALITY OF THE UNITED STATES FOOD SUPPLY, WITH PROVISION FOR THE CONDUCT OF SCIENTIFIC RESEARCH AND DEVELOPMENT IN SUPPORT OF SUCH PROGRAM AND PLAN

MARCH 1 AND 22, 1988

Printed for the use of the Committee on Governmental Affairs

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ROLE OF NUTRITION IN HEALTH AND DISEASE

TUESDAY, MARCH 1, 1988

U.S. SENATE,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
Washington, DC.

The Committee met, pursuant to notice, at 9:35 a.m., in room SD-342, Dirksen Senate Office Building, Hon. John Glenn, Chairman of the Committee, presiding.

Present: Senators Glenn, Sasser, Bingaman, Roth, and Heinz.

OPENING STATEMENT OF CHAIRMAN GLENN

Chairman GLENN. The hearing will be in order.

Good morning and welcome to today's hearing on the role of nutrition in health maintenance and disease prevention. This morning's hearing will investigate what we do and do not know about the relationships between diet and health.

It is meant as a background hearing and will set the stage for our upcoming hearing on S. 1081, the National Nutrition Monitoring and Related Research Act of 1987. We will have that hearing on March 22, 1988.

Recently we have seen a lot of press reports; we have almost been flooded with reports making various recommendations about what we should and should not be eating. For example, early in 1986 scientists hailed oat bran as a substance that could lower serum cholesterol, enhance the absorption of sugar and possibly lower blood pressure.

Since then diets have emerged advocating intake of a half cup of oat bran each day. You can choose whether you prefer it in the form of oat muffins or oat meal or any other form you want to eat it in, I guess. But oat bran is not the only food fad to catch the public's eye. I'm not saying it is just a fad. I am just saying it is one of the things that we want to look at. It may be quite valid for all that I know.

But numerous newspaper articles and books are lauding the beneficial effects of high fiber, low fat diets in preventing or reducing the risk of developing breast, prostate, colon cancer and cardiovascular disease. Less mainstream theories include those urging tennis players to breakfast on cereals such as Shredded Wheat and Grapenuts, those calling for consumption of high protein foods such as fish, chicken and beans when one needs to be particularly alert.

I hope everybody in the room ate their protein for breakfast this morning so we do not have anybody nodding off in the back of the room.

We have seen reports such as the one very recently out of U.S. News and World Report—this is just a black and white cover of it—but in part of that that we go into is called, "The Truth About Designer Diets."

In other words, diets that they say will address specific diseases or prevention of those diseases or cure everything from herpes to hangnails, I guess, that you can do by eating certain things.

And the things that they go into in here are quite interesting, as a matter of fact. It starts off with one section on heart disease and what you can do there and it says, plugging bran and niacin in stress reduction. Another section is on cancer prevention; another on pain attenuation; another on effects of aging, "Can your menu get you past 3-score years and ten?" I found that one to be particularly interesting to me. Immunity. Another one on sports, promising athletic bodies and brighter minds; alertness, a brain claim, protein for alertness, carbos to relax.

I thought they went a little too far when they questioned ice cream in the American society, but they had a section on pondering the ice cream question. And maybe it was no accident that they had that directly ahead of the ending thing which said, "Sorting out the sense from the nonsense."

But that is sort of what we are trying to do this morning here is separate out some of the sense from the nonsense with experts from around the country. In addition to this barrage of advice from the popular press, Federal agencies have also offered their own guidance.

In 1985 the U.S. Departments of Agriculture and Health and Human Services jointly issued a pamphlet, "Dietary Guidelines for Americans," that recommended that Americans eat foods with, "adequate starch and fiber" and avoid, "too much saturated fats, cholesterol, sodium and sugar." The terms "adequate" and "too much" were never defined.

The National Cancer Institute followed these guidelines with more detailed information that advised people, for example, to consume whole grain products more often than refined bakery and snack products. Professional organizations such as the National Academy of Sciences and the American Heart Association have also contributed to the debate about dietary guidance, each offering its own recommendations for disease prevention diets.

The American Heart Association, among others, suggests that fat intake should be less than 30 percent of total calories, and cholesterol intake should not exceed 300 milligrams per day. Presumably, these guidelines translate into a dietary program that will prevent coronary heart disease.

I wonder how many people, though, how many housewives out there know exactly what 300 milligrams per day really is and how they relate that to what they are fixing for their families. That is one of our problems.

Inundated with so much information, we may feel confused and at a loss to decide which recommendations to follow. Who do we listen to, anyway? And what do we eat to maintain our health and prevent the onset of chronic disease? And what is the Government's role in disseminating this information? Our witnesses today, representing a spectrum of academic backgrounds and Government, will help us answer some of these important questions.

There is also a debate raging on whether we know enough about diet and disease relationships to prescribe health maintenance dietary programs. Some people claim that the public health professionals have generated too much unfounded fear about certain foods. Others maintain that, to the contrary, such dietary recommendations are based upon very solid research data.

So we would welcome our witnesses' perspectives about the format and content of dietary advice being given to the public, either from the Government or private sources. This and future hearings should serve as good forums for further discussion of this important topic.

We will also explore the role of the Federal Government in nutrition research and dietary guidance. What is the Federal Government's current role in funding, coordinating and implementing these activities? And perhaps more importantly, what should this role be in the future? Is this one of those things that should be privatized, or is this one of the things that should get more stress from Government?

The Federal Government does not have a fixed definition for human nutrition research. Year to year it changes. As a result, it is hard to know the extent of Federal support for university-based nutrition research. Moreover, since funding is not a line item in the budget of any Federal agency, we cannot be certain what proportion of an agency's total resources, both human and financial, are specifically allocated to human nutrition research. This research is vital for the present and future health of our children, adult and elderly populations. Addressing these issues today will improve our health and quality of life now and in the coming years.

Much mythology surrounds the contribution of diet to chronic illnesses such as cancer and heart disease. Obviously, people need to be well-informed before they can be well-fed. This morning's discussion will help clarify the confusion spawned by the proliferation of dietary advice and will help elucidate the appropriate and effective Federal role in ensuring real progress in human nutrition research.

I want to thank you all for your attendance and I look forward to a morning of excellent testimony.

Senator Roth, do you have any comments?

Senator ROTH. Mr.Chairman, I have a statement for the record.

Chairman GLENN. Without objection, it will be included in the record at this point.

[The opening statement of Senator Roth follows:]

OPENING STATEMENT OF SENATOR ROTH

Mr. Chairman, I commend you for holding this hearing, and I look forward to the statements of today's witnesses. The focus of this hearing on the impact of dietary factors on health as well as disease merits the attention of all Americans.

I understand that dietary patterns and diet intervention, if managed appropriately, can help people prevent the onset of diseases such as certain cancers or coronary heart disease. Cancer as well as heart disease certainly are dreaded diseases that afflict a great number of our people. Minimizing the rate of mortality from either disease has received substantial attention. With the technological and research breakthroughs achieved in the last ten years alone, preventive medicine has made measurable progress in saving the lives of Americans. Sadly, however, some people are predisposed to certain diseases—genetically or even because of their lifestyles. This hearing will provide an excellent forum for discussing nutrition and its impact on our health. I hope the lessons learned from our witnesses will help to further educate the American public about the importance of good nutrition and a healthy diet.

I look forward to today's testimony and, the opportunity to address the concerns of diet and health.

Chairman GLENN. Senator Heinz, do you have any comments?

OPENING STATEMENT OF SENATOR HEINZ

Senator HEINZ. Yes, Mr. Chairman. I very much want to commend you on having this hearing, in part because I have had a number of years of experience with this subject when I was in the private sector, and it is indeed a vital subject.

The question and the interrelationships of how good a job we are doing martialling our research and disseminating our research, acting on the best judgment of people in the field, either as private citizens or at the Federal Government level, is indeed a vital national question.

As most of us realize, nutrition plays a leading role in good health at all ages. The sad fact is that there are too many Americans who go without proper nutrition in America today. You can find them at every age level, every income level, in every group. In 1986 this country spent $458 billion on health care. We, the Federal Government, paid for about a third of that bill, just over $134 billion.

Given the relationships that we know exist between nutrition and disease, the size of the annual cost that we and others pay, that alone warrants our careful attention to preventive strategies. Better use of research about the relationship between diet and disease is fundamental if we are going to move forward against the widespread health problems which range anywhere from infant mortality to cancer and heart disease.

Mr. Chairman, to paraphrase a nutritional add on television, your hearing is the right thing to do.

I want to emphasize, not to the exclusion of other issues, where we are in just one of these areas, and that is prenatal care. We are here working towards the goal to prevent infant mortality and ensure that all babies have a healthy start in life. We all think we are doing that.

Good prenatal care, which includes a healthy diet, has, we think, been a key part of that effort. Yet, the United States remains one of the most dangerous places in the industrial world to be born. Recent statistics released by the Children's Defense Fund show that for the first time since 1960 our infant mortality rate failed to decline.

For a black infant, the picture is much worse. The fact is that a black infant born in America is less likely to live to the age of one than a baby born in Cuba, Bulgaria, or Costa Rica. The Federal investment in programs such as the Special Supplemental Feeding Program for Women, Infants and Children, WIC, has been proven successful because of its grounding in medical evidence.

Studies by the Institute of Medicine and others have shown that for each dollar we invest in prenatal care, we save over $3 in the cost of neonatal hospital care alone.

Mr. Chairman, preventing infant mortality and low birth weight through better health strategies, and most especially through nutrition, is just the beginning of the topics that we will be discussing today. But across the lifespan, sound nutrition makes sense at any age.

Today's expert panels remind us of the key role that must be assigned to eating right, and I ask unanimous consent that the balance of my statement be placed in the record at this time.

Chairman GLENN. Without objection, it will be included in the record.

[The prepared statement of Senator Heinz follows:]

PREPARED STATEMENT OF SENATOR HEINZ

Mr. Chairman, I want to commend you for convening this hearing on nutrition, health, and disease. Nutrition plays a leading role in good health at all ages and I welcome efforts to improve the Nation's knowledge of the importance of diet and nutrition. The fact is, sadly, there are too many Americans who go without proper nutrition in America today.

In 1986, the national costs of health care were $458 billion dollars. The federal government paid thirty-percent of this bill, over $134 billion dollars. The size of this investment alone warrants our careful attention to preventive strategies. Better use of research about the relationship diet and disease is fundamental if we are to move forward against widespread health problems such as infant mortality, cancer, and heart disease.

Our experience demonstrates that progress can be made. For example——

We are working toward a national goal to prevent infant mortality and ensure that all babies have a healthy start in life. Good prenatal care, which includes a healthy diet, has been a key component of these efforts. In this case, an ounce of prevention is worth a ton of cure.

Yet, the United States still remains one of the most dangerous places in the industrialized world to be born. Recent statistics released by the Children's Defense Fund show that for the first time since 1960 our infant mortality rate failed to decline. For a black infant the picture is much worse. The fact is that a black infant born in America is less likely to live to the age of one than a baby born in Cuba, Bulgaria, or Costa Rica.

A federal investment in programs such as the special supplemental feeding program for women, infants and children (WIC) has been proven successful because of its grounding in medical evidence. Studies by the Institute of Medicine and others have shown that for each one dollar we invest in prenatal care we save over three dollars in the costs of neonatal hospital care alone.

WIC provides nutritional counseling and food packages to poor families across the Nation. In my home state of Pennsylvania 179,000 people receive WIC program benefits each month. Unfortunately, there are another 179,000 women, infants, and children who remain at risk and are not served.

Preventing infant mortality and low birth weight is just the beginning. Although dietary needs may change across the lifespan, sound nutrition makes sense at any age. Today's expert panels remind us of the key role that must be assigned to eating right.

A range of factors influence the chronic diseases often associated with advanced age. Despite our diligence through medical research and treatment, heart disease and cancer remain the leading causes of disease and disability in the United States. As our witnesses will testify today, the role of nutrition in either preventing or treating a disease cannot be underestimated, it remains one of our greatest weapons.

Sifting through the hype and hyperbole regarding diets—fiber, calcium, vitamin C, fish oils, high and low density fats—to find the grains of truth has become a national obsession. Making better use of scientific facts about nutrition and health is a public service.

This committee's examination of nutrition and health in America can help to bring order to federal efforts to improve health for all Americans. I look forward to the testimony of today's witnesses.

Thank you, Mr. Chairman.

Senator HEINZ. If I might be allowed one additional editorial comment, Mr. Chairman. One of the topics I hope we get into is the role of our universities, or perhaps I should say, the relative lack of role, of most of our university medical schools in teaching doctors something about nutrition.

It is an area that goes little noticed. You would think that with the 120-some-odd medical schools in this country, that nutrition would be at least a required subject, or at least one course in nutrition, be a required subject before you could become a doctor.

I hope someone puts on the record exactly what kind of nutritional education primary care physicians get. It is an embarrassing statistic. Somebody might also want to ask what activities do universities play—in disseminating nutritional information within the state education systems that they are frequently a part of?

We might add, what are the responsibilities of school boards, who are creatures of those self-same state governments, to the students who they teach and the parents who pay the bills?

Mr. Chairman I, again, commend you and salute you for taking on a subject where I think we have made a fair amount of progress in recent years, but I think it has more been by luck than by design.

There is lot of information, a lot of know-how, a lot of wisdom out there that we could do a lot better job of tapping and directing and focusing. I think this will prove to be as good a series of hearings and it will prove indeed to be a historic opportunity, Mr. Chairman, that you have both grasped and seized.

Thank you.

Chairman GLENN. Thank you very much, Senator Heinz, indeed.

And now to the person, for comments, who really triggered off a lot of the Committee's interest in this particular area, who pushed for it and who has put in for himself as the author, and a number of the rest of us have cosponsored it, Senate Bill 1081 that says at the beginning of that bill, the purpose is to establish a coordinated national nutrition monitoring and related research program and a comprehensive plan for the assessment of the nutritional and dietary status of the United States population and the nutritional quality of the United States food supply with provision for the conduct of scientific research and development in support of such program and plan.

Senator Bingaman, you are to be commended for bringing this to our attention, primarily. We were glad to pick up on it and go ahead with hearings. You will be chairing some of the hearing time on this and have taken the lead in this and we are glad to have your opening comments this morning.

OPENING STATEMENT OF SENATOR BINGAMAN

Senator BINGAMAN. Thank you very much. I will just put a statement in the record, Mr. Chairman. I want to join Senator Heinz in commending you for holding this hearing and the hearing scheduled on of March 22, which will look more specifically at the nutrition monitoring legislation.

Excellent witnesses are scheduled, and I am looking forward to their testimony. I do think it is a very important subject which has not gotten enough attention at the Federal level, or in Congress, so I compliment you.

[The prepared statement of Senator Bingaman follows:]

PREPARED STATEMENT OF SENATOR BINGAMAN

Thank you, Mr. Chairman. I wish to commend you for your leadership in organizing this critical series of hearings on the nutritional status of this country.

Since coming to the Senate in 1983, I have come to realize the vital role that diet and nutrition play in a total health care delivery system, and I actively have sought ways in which the Congress could help improve health care, reduce health-care costs and generally promote good health. Today's hearing, along with the hearing you have scheduled for March 22 on Nutrition Monitoring, is in line with those efforts, and I am pleased to be associated with you and this Committee's work.

I am sure the excellent group of witnesses here today can relate with more force and eloquence than I the importance of dietary habits throughout life. These experts have spent years studying the relationship between diet and health, and they have valuable experiences to share with us. Using today's hearing record as a foundation, I believe we in this Committee can go far in encouraging the Congress to seriously address the state of nutrition research and education in the United States, and thereby improve the quality of health for all Americans.

There is much we already know. We know with certainty that exercise and fitness, the safe use of medicine, smoking cessation, injury control, and preventive health services lead to healthier lifestyles; but what we eat is perhaps the most significant factor in reducing the risk of disabling disease.

Good nutrition throughout life, beginning even before a baby's birth, is directly related to our good—or bad—health. Choosing the wrong foods at any stage of life may complicate the future well-being of any one of us. We now know that overeating and eating non-nutritious foods can lead to overweight and obesity, and obesity can lead to an array of health problems—for example, diabetes and high blood pressure—which can lead to heart disease and stroke.

But better nutrition is not up to individuals alone. It also depends on social and economic conditions, and upon policy makers. Again, we have an outstanding group of experts here today who can tell us where we have been and where we are headed. The members of this Committee and of the Congress would do well to heed their messages—our lives and the lives of our children may depend upon it. Thank you, Mr. Chairman.

Chairman GLENN. Thank you very much.

We have three different panels today: Dr. Michael McGinnis, Deputy Assistant Secretary for Health, Office of Health Promotion and Disease Prevention, Department of Health and Human Services here in Washington is our first witness this morning, and then we have two other panels that I will get into beyond that.

The first panel after Dr. McGinnis will basically take up some of the dietary and nutritional sciences view of cancer and of heart disease. The second panel will then hit the extremes of the age scale in looking into dietary concerns with regard to children and with regard to the elderly. That is the general format for this morning.

Dr. McGinnis, we welcome you this morning. Dr. McGinnis is the Assistant Secretary for Health at the U.S. Department of Health and Human Services. He has responsibility for disease prevention and health promotion activities at the five principal agencies of the U.S. Public Health Service.

Dr. McGinnis also serves on the Food and Nutrition Board of the National Academy of Sciences, and has edited various publications on diet and health in the past.

Dr. McGinnis, we look forward to your statement. I would say to all of our witnesses this morning, our time this morning is not what we would like. We would like to give each one of you a full morning, but if your statements can be summarized, the main points, the entire statements will be included in the record and we would welcome any shortening of reading of the statements because we can always read those, so we can keep our time to question and answer time as much as we possibly can.

Senator HEINZ. Mr. Chairman, might I be allowed a brief word? I thank you for your generosity and your time. I am in the embarrassing position of having to go and testify before another hearing and then do a Banking markup. Ironically, the Committee I am testifying for is the Agriculture Committee and I am testifying on food assistance for the hungry.

So, although I cannot be here with you all morning, and that is where I will be, I am with you in spirit, which is not quite as good.

Chairman GLENN. You are permitted to go only if you get nutrition research included in those appropriations.

Senator HEINZ. This is food banks. Thank you.

Chairman GLENN. Dr. McGinnis, welcome.

TESTIMONY OF J. MICHAEL McGINNIS, M.D., DEPUTY ASSISTANT SECRETARY FOR HEALTH, OFFICE OF DISEASE PREVENTION AND HEALTH PROMOTION, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, WASHINGTON, DC

Dr. McGINNIS. Thank you very much, Mr. Chairman.

As noted, I serve as Deputy Assistant Secretary for Health at the Department of Health and Human Services. One of my jobs there, in addition, is as chairman of the Departmental Nutrition Policy Board, so I am particularly pleased to be here with you today. We believe that this topic is of vital importance to the Nation's health and appreciate the leadership that you and the Committee are taking in this arena.

There is no magic bullet in the area of nutrition and health. The keys are moderation and balance, but there are clear dietary steps that Americans can take to improve their health prospects, and I would like to review a few of the elements there. I will submit the full testimony for the record[1] and try to highlight just summary components of the testimony.

In recent years researchers have produced increasingly compelling evidence that dietary patterns and practice influence the risk of developing major chronic disease conditions that constitute the leading causes of death and disability among Americans. We have seen in this century the virtual elimination of rickets, goiter, pellagra and other nutrient deficiency diseases that were once responsible for substantial illness and death among Americans, and also with better nutritional status better prospects for babies against life threatening infectious diseases. The result has been a dramatic improvement in overall life expectancy for Americans.

But as infectious and nutrient deficiency diseases have gradually declined in prevalence, they have been replaced by new health problems related to dietary patterns. Increasingly important as causes of illness and death among Americans are diseases such as heart disease, cancer, diabetes, stroke, liver disease, skeletal disease, obesity, dental disease and kidney disease.

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[1] See p. 140.

Just three of this list that I have mentioned—heart disease, stroke and cancer—represent well over half of all deaths in the United States every year. In contrast to nutritional deficiency diseases caused by inadequate intake of essential nutrients, many of these conditions are associated primarily with the over consumption of specific nutritional factors. Among these, fat, cholesterol, salt and alcohol appear to be the most important.

We know that the relationships between diet and disease are complex, that they vary among individuals and populations, and that environmental, behavioral and genetic factors come into play. Foods contain a variety of elements. Some promote disease. Others are protective. Nevertheless, information about the overall effects of Americans' dietary patterns enable us to identify basic changes in eating habits that would greatly enhance health status.

As a primary example, Americans would be better protected against certain diseases if they would decrease their consumption of foods high in fats and cholesterol and put greater emphasis on foods high in complex carbohydrates, starch and fiber.

Obviously, there are caveats about the knowledge base regarding nutrition and health. It is incomplete and additional research is needed, especially when dealing with the interaction of multiple risks—that is, risks that are genetic, environmental and behavioral—research information does not always prove causality in the classic scientific sense.

Even where a specific dietary factor is associated with a specific disease, the avoidance of that particular factor will not necessarily prevent the condition. With coronary heart disease, for example, the relationship of consumption of total and unsaturated dietary fats to increased risk has been demonstrated and that risk can be reduced by increasing the proportion of mono- and polyunsaturated fats in the diet.

However, genetically predisposed populations have been identified, and we know as well that tobacco smoking and high blood pressure contribute to coronary heart disease. Also, individuals metabolize fats in the body in different ways.

Limits in available technology make definitive resolution of these issues difficult if not impossible for the population as a whole. Because nutritional evidence rarely comes close to meeting the classic scientific standards for proof, the relationship between diet and disease must be inferred from the totality of existing laboratory animal, dietary, clinical and epidemiologic evidence.

I would like to give you a brief account of current understanding of the role of diet for some of the key health threats to Americans. Coronary heart disease, first.

Although deaths from coronary heart disease are declining in this country, heart attacks still account for more deaths annually—that is, over half a million—than any other single cause, including cancer. The major risk factors for coronary heart disease are high blood pressure, cigarette smoking and high blood cholesterol. Diet affects two of these factors—blood pressure and blood cholesterol.

Blood cholesterol is of special concern. Between half and two-thirds of adult Americans are above the level identified for increased risk, that is, roughly 200 milligrams per deciliter, and 25 percent are at levels posing substantially higher risks. Dietary factors associated with increasing risk of coronary heart disease are fat—particularly saturated fat—cholesterol and energy imbalance leading to obesity.

Secondly, high blood pressure. High blood pressure, hypertension, that is, affects nearly 60 million Americans, of which 39 million are under the age of 65. Thirty-eight percent of blacks are estimated to have high blood pressure, compared to 29 percent of whites. This condition is a major risk factor for both coronary heart disease, the leading cause of death in the United States, and for stroke, which is the third most common cause of death.

Dietary factors that contribute to high blood pressure include obesity and excessive intake of sodium and alcohol. The National Research Council recommends 1.1 to 3.3 grams per day for safe and adequate sodium consumption, but the average adult consumes 4 to 6 grams. Indeed, Americans consume an estimated 10 to 20 times the amount of sodium estimated as necessary for metabolic function.

Cancer is the second leading cause of death in the United States. Its relationship to diet will be discussed in detail by Dr. Greenwald later this morning. The dietary factors that have been associated in epidemiologic studies with either the development of cancer or its prevention are fat, calories, fiber, vitamin A, and alcohol.

Diabetes affects nearly 11 million people and is the 7th leading cause of death, at about 35,000 deaths per year. Obesity greatly increases the risk of developing Type II, that is, non-insulin dependent diabetes, and studies indicate substantial benefits from weight loss. It is also likely that reduction of calories, fat, salt, alcohol and simple sugars and increased intake of foods containing starch and fiber are beneficial in the treatment of this condition.

Obesity increases the risk of high blood pressure, diabetes, high blood cholesterol, and therefore contributes to the premature mortality associated with these conditions and those for which they in turn are risk factors; heart disease, stroke, and renal disease.

In addition, obesity raises the risk for gall bladder disease and for certain cancers. Obesity may well be the most prevalent diet related problem in the United States. It affects 34 million adults ages 20 to 74 years with the highest rates observed among minority groups and the poor.

There are several other conditions that I will just mention without elaborating that have important dietary components. They include osteoporosis, dental diseases, kidney disease and so forth.

Taken together, these observations suggest the potential value of an overall change in dietary pattern from one based on foods high in energy, fat, cholesterol, sugar, salt and alcohol, to one that contains greater amounts of foods containing protective factors such as complex carbohydrates and fiber as well as certain vitamins and minerals. They also suggest a lifestyle involving more regular exercise in order to improve and maintain an appropriate body weight would produce multiple health benefits.

The Department of Health and Human Services is committed to addressing these issues in numerous ways, including development and dissemination of dietary guidance information, the Food and Drug Administration's initiatives to improve information contained on food labels, surveys of dietary intake and of disease prevalence, initiatives of the specific institutes of the National Institutes of Health, such as the NHLBI, NCI and NIDDK, to reduce diet related risk factors among the population—and an example is the National Cholesterol Education Program with NHLBI—cooperative efforts with state health departments to develop chronic disease surveillance and prevention programs, development of nutrition and health objectives for the Nation through 1990 and the year 2000 objectives, and the nearly $250 million we are now spending on nutrition research.

In addition, we will be releasing in the coming months the first Surgeon General's Report on Nutrition and Health to fully review documentation for the importance of nutrition to health and establish a foundation for Federal policy in this area for the future.

I would like to conclude, Mr. Chairman, by emphasizing three central points, if I may. Those points are as follows. One, diet is a very important contributor to health and disease. When you consider the contribution of dietary factors to heart disease, cancer, diabetes, stroke, osteoporosis, obesity, dental disease, kidney disease and liver disease, it is the most important controllable factor for Americans who neither smoke nor drink abusively.

Two, the numbers are large. Although the estimates are very rough, based on current information, it has been said that perhaps 400,000 Americans died prematurely last year due to dietary factors—400,000. Compare that to the 350,000 who died from tobacco and the 14,000 who died from AIDS in 1987.

Three, chief among the dietary factors contributing to disease is total fat and cholesterol, which are directly or indirectly involved in most of the conditions mentioned. The American diet is roughly 40 percent fat versus the 30 percent recommended by the American Heart Association, the National Academy of Sciences, the American Cancer Society, and a number of groups, the 25 percent, roughly, estimated and contained in the Japanese diet, the 15 to 20 percent estimated in the Chinese diet, and the 10 percent that is suggested by rigorous cardiac rehabilitation programs in various loci. Total caloric intake is closely related to fat and cholesterol intake and is also important.

Mr. Chairman, I appreciate the interest that you have and your Committee have in this subject and I would be pleased to answer any questions that you may have at this time.

Chairman GLENN. Thank you, Doctor, very much. Just to start off, in 1986 I received a report, "Human Nutrition Research: The Federal 5-Year Plan," prepared by the Interagency Committee on Human Nutrition Research, which was cochaired by the Department of Health and Human Services and the Department of Agriculture.

A letter accompanying the report states that it:

> Documents efforts to coordinate various aspects of human nutrition research within the Federal Government. It's ultimate purpose is to assist in the develop-

ment of research strategies that will support Federal activities to maintain, improve and monitor the public's nutritional status.

Can you tell us something about that coordination? How successful is it? What is the status of it? How well is your Department working with the Department of Agriculture that has normally been in a food promotion mode rather than having a primary concern with nutrition? Can you give us some comments on that?

Dr. McGINNIS. Yes, I am pleased to comment on that subject. I think that the cooperation between the Department of Agriculture and the Department of Health and Human Services is really quite good in the area of nutrition research and I should note that it spans beyond those two departments as well.

The Interagency Committee for Human Nutrition Research, which has been operating now for a number of years, cochaired, as you mentioned, by the respective assistant secretaries of the two Departments, includes the major administration agencies conducting nutrition research, including, in addition to USDA and HHS, the Department of Defense, the Department of Commerce, the White House Office of Science and Technology Policy, which has a coordinative responsibility, and a number of other agencies that are all conducting various aspects of human nutrition research.

One product of this cooperation has been the development of this Federal 5-year plan which highlighted, I believe, six key areas that need special emphasis in the area of human nutrition research. We have a commitment to reviewing at our quarterly meetings of the Interagency Committee on Human Nutrition Research the progress underway both in general terms and specifically with respect to certain research protocols.

I think that the combination of joint development of a Federal plan and the regular meetings and the collective sponsorship of symposia is a good indication of an area in which there is this quite solid collaboration among the various parties involved.

Chairman GLENN. Your 5-year plan appears to be a good list. It might be termed a wish list, I guess. It does identify very important research areas. I am concerned about what action we are having. It is one thing to say interagency cooperation. I am more interested in interaction, I guess, than I am interagency cooperation.

I might add, in Washington whenever there is an area of big interest comes up, the Washington response to it too often is we form another committee and then think we are doing something.

How successful have you been in getting information out to the users, out to all the American people, and into medical schools? I was reminded when briefing with staff earlier this morning the thing that Senator Heinz brought up, nutrition in medical schools is usually an elective. It is something they either take or do not take, something as important as that. It is hard to believe, but it is.

Are the guidelines being used in medical school? Are they even being used in nutrition schools, I guess would be a better question? Usually, as I understand it, even nutrition schools are part of the agriculture department in most colleges and universities where they are concerned more about food use promotion than they are in nutritional concerns.

What are we doing to alter some of these patterns of awareness at colleges and universities where our doctors are being trained?

Are we being effective in those areas through the interagency operation?

Dr. McGinnis. Let me respond, if I may, on the two aspects of your question; one, specific examples of collaboration between our agency and USDA; and secondly, nutrition in medical education.

On the first, I will give you two examples that I think indicate a fairly close collaboration at the practical level. One is that USDA sponsors a series of centers focused in university settings that are designed to assess nutrient requirements throughout the life cycle. For example, there is a center on nutrition and aging, a center on nutrition and childhood growth, and so forth.

These centers often have, in addition to their own USDA sponsored research budgets, often grants from our National Institutes of Health to conduct research. So there is a funding collaboration in that respect.

In addition, our various institutes in the conduct of elements of their intramural research often rely on USDA analyses that are conducted in USDA laboratories for some of the background information. In my view, collaboration can always be better, but I think this is one of the areas in which collaboration is reasonably good, the area of nutrition research.

On the question of nutrition in medical education, I have a special interest in that area, having served on a panel that the National Academy of Sciences convened, chaired by Dr. Winick, from whom you will hear later, that looked at the issue of nutrition in medical education.

I would like to see more nutrition education included in the medical training process because of our obvious belief in its importance in the prevention of disease. I would like to see medicine focus in general more on the question of prevention of disease and use the artillery, if you will, that is available to it in nutrition as a component.

We have taken certain steps, including the sponsorship last year of a special symposium on this subject, and we are disseminating now the results of that symposium to all the deans of medical schools with a plea to review their curricula for opportunities to improve nutrition.

I am one who believes that even though the situation is now not optimal, that it will change in the future. It will change for two reasons. One, it will change because the science base is becoming better understood, and we need to, as you say, get the information out to them about those changes in the science base. Curricula will change in response to a stronger science base.

But perhaps the most important phenomena in this respect will be consumer demand. We have out there in the physician world an increasingly competitive environment. As more and more physicians are in practice they are finding that they are having to compete for patients. And with an enlightened consuming public that is demanding more information about the role of nutrition in health, I think physicians and medical education in turn are going to have to meet that demand and we will see things change.

Chairman Glenn. Well, I do not disagree with you at all except I think maybe, whether the cart gets before the horse here or not, it seems to me the Government should not be saying, there go my people, I will rush out and lead them. We should be taking the lead with research and pointing out what the advantages of nutrition are and doing everything we can to get it into med schools and help the people get the benefit of this on down the road, instead of waiting for a great tidal wave of consumer interest in this. I think we can do a lot more to take a lead in that.

We are going to keep the questioning to 5 minutes so we can kick this back and forth here a little bit more this morning.

Senator Bingaman?

Senator **Bingaman**. Thank you, Mr. Chairman.

Let me start by asking whether the American public's knowledge of proper nutrition has improved significantly in recent years?

Dr. **McGinnis**. Well, I think that we have seen a change. It is not improved to the extent that it should and there is a tremendous amount of confusion out there, but we clearly have seen an increased willingness on the part of the public to change its dietary patterns, to reduce fat intake, to reduce salt intake and a substantial share of the American public that is overweight has tried to develop a weight loss regimen, for an example.

Senator **Bingaman**. To what extent is that a result of efforts by the Federal Government to disseminate proper, correct, usable information on the subject?

Dr. **McGinnis**. Well, I would hope it is certainly in part a result of that. The Federal Government has been very involved in the dissemination of the information available and the relationship between diet and health. Examples go back to the initiative here in Congress with the Senate Select Committee that issued its dietary goals, and followed closely on that was the Surgeon General's report on Disease Prevention and Health Promotion in Healthy People that emphasized dietary measures that could be taken, the dietary guidelines that were co-issued by USDA and HHS, the work of the various institutes, NHLBI and NCI, for example, in disseminating dietary guidance.

I think there has been an impressive amount of Federal effort to lay a foundation that can be picked up on by other avenues, by the news media, television, radio and newspapers and journalists and so forth. It is hard to say in a point to point relationship how the various Federal initiatives have triggered specific dietary changes, but I have confidence that the general tone that is being set by Federal activity has made a big difference.

Senator **Bingaman**. I have the impression that there has been a lack of Federal initiatives with regard to dietary education through the school systems. You are aware that a provision of the omnibus Elementary and Secondary Education Act directs the Secretary of Education to at least consider the re-establishment of an Office of Comprehensive Health Education in the Department of Education.

I have the sense that the Federal Government has essentially left that up to somebody else. Am I wrong?

Dr. **McGinnis**. Well, without commenting on the best way to change the situation, I will say that we are concerned about the situation with respect to school kids. We are concerned about it because unlike the adult population, in which we do see at least a willingness and indeed in some cases an actual change in dietary practices with reductions in fat intake and so forth, and reductions in serum cholesterol levels as a result, with the childhood population, the trend seems to be in the reverse.

Indeed, our indications are that the fitness level, including body composition, of school children between the ages of 6 and 17 has declined, that indeed there is a skin fold thickness increase of 2 to 3 millimeters based on surveys of a year ago compared to those of 20 years ago. The combination of reduction in physical education programs in schools, the increased television watching, the propensity to eat fast foods, which are very high in fat and cholesterol, is a worrisome trend in children.

Senator BINGAMAN. Do you think part of the solution might be better health education through our schools?

Dr. McGINNIS. Well, we would certainly like to see health education as an integral component of education in general.

Senator BINGAMAN. I think that is all the questions I have right now, Mr. Chairman.

Chairman GLENN. Thank you, Senator Bingaman.

Dr. McGinnis, you identified that we are spending about $250 million on human nutrition research, I believe was your figure. We have had trouble identifying some of these expenditures and getting a real solid estimate on what we are really spending, because they are not a line item in most departments. They are just not a line item that you can figure out or just pick them out and total them up and that gives us our total.

There are various definitions of what is being spent, and I would appreciate your providing for the record—I will not ask you to go through it right now—a rundown on that as detailed as you can, where the money is going and what activities it is supporting and where your $250 million figure comes from. There are various estimates of what is actually being spent.

If you could give us a rundown on that and we will put it in the record when this is printed.

Dr. McGINNIS. I would be happy to do that.[1]

Chairman GLENN. I appreciate that. Thank you.

Can you tell us any of the highlights of the Surgeon General's Report on Nutrition and Health? That has been in preparation. I believe it has been in study and in preparation for what? Four years? Five years?

Dr. McGINNIS. About 4 years.

Chairman GLENN. It should be a very definitive study after that length of time. Can you give us any of the highlights? It is due to be out shortly. Can you give us a date when it will be released? And any of the highlights of it?

Dr. McGINNIS. Well, I cannot give you a precise date because in an effort as substantial and comprehensive as this is there is a need to ensure that we have checked very closely all the facts and had extensive expert review. Therefore, it is difficult to predict with precision when it will be out, but our anticipation is that it will be out sometime during the summer.

Chairman GLENN. Okay. Is there a target date for that?

Dr. McGINNIS. Well, the target date is midsummer.

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[1] See p. 622.

Chairman GLENN. Well, we make that July 15th, then. We will hope for that.

Dr. McGINNIS. Maybe we will even beat that.

Chairman GLENN. All right. Good. Can you tell us, though, probably even more importantly than when the thing comes out, how you plan to implement the results of that report? What do you plan to do about it? I would hate to see a 5-year study become another book end on somebody's shelf as its final destination.

If we put all of that study into it, how are we going to implement it? What kind of funding do you plan to ask for? Is that included in this year's budget? And what plans do you have to implement it?

Dr. McGINNIS. Implementation, of course, as you say, is key. Disseminating the results is what is important, and the dissemination process will take a variety of forms. One, it will obviously have an impact on the dietary guidelines that we issue periodically with the Department of Agriculture. Those dietary guidelines have provided the basis for our nutrition education efforts in general and I would anticipate that the Surgeon General's Report will be reflected extensively in those guidelines.

In addition, we have plans to work with the private sector in the development of public service announcements and public education efforts around elements of the Surgeon General's Report. I can give you an example of an effort that we have already begun with the Kaiser Family Foundation to mount a major public education campaign related to the issue of dietary fat and cholesterol intake.

Chairman GLENN. How do we plan to make the guidelines more effective, though? We do not even have them being taught in medical school. What are we going to do to get the guidelines more universally used? That is the concern. It does not do any good to have another study unless we are going to use it.

We have put out guidelines and that is fine. We have put little notations in print so fine I cannot read them on cereals and things like that as to what the cereal is supposed to do for you or against you. But how are we going to make the guidelines more effective and make them really mean something in med school and the press and make them meaningful to people?

I do not mean saying 30, 35 grams or something. That does not mean much to folks unless you say—if you weigh two bowls full of Wheaties or something like that, then it means something. Do we have any program to make the new guidelines really get into something that people can use and are used in med schools so we start making use of this?

Dr. McGINNIS. Well, yes, as a matter of fact. Let me come back to the medical school issue. Again, there are multiple avenues that need to be used. One is the labeling of foods and FDA is currently reviewing the ways in which labels can better get messages across to people that reflect the principles that will be in the Surgeon General's Report.

Chairman GLENN. Do you plan to ask for more funding to do some of these things? Is that in the budget that we have been presented?

Dr. McGINNIS. Well, aspects of it are in the budget that you have been presented. Of course, I cannot comment on future requests for funding that might be forthcoming.

The issue of medical education——

Chairman GLENN. Well, just before we leave that, and my time is almost up here, but this 250, are we increasing that now?

Dr. MCGINNIS. Yes.

Chairman GLENN. Is that in this year's budget?

Dr. MCGINNIS. Well, it is not a line item. Just as in a variety of our important research enterprises, like molecular biology, we do not have a line item for that area. But the aggregate amount for nutrition research is increasing.

You will hear a little bit about that, for example, from Dr. Greenwald when he testifies about the research agenda related to nutrition in the National Cancer Institute. We could also provide information about what is going on in the National Heart, Lung and Blood Institute and the National Institute of Diabetes and Digestive and Kidney Diseases as well.

These are active and important nutrition research enterprises that are providing national leadership.

Chairman GLENN. Well, we are looking forward to getting that report, but I am also looking forward even more than the report to how we are going to implement so it does not become a 5-year study that does not get much use.

I want to make use of something that is as extensive as that and there is a lot of public interest in this now, as indicated by the U.S. News and World Report thing I held up and quoted from during my remarks.

So, if you can, when you give us that breakdown of the $250 million, can you compare that with previous years also?

Dr. MCGINNIS. Surely.

Chairman GLENN. Because we have difficulty at this end of the avenue pulling things out and knowing what is going into this area of nutrition research and implementation and we want to see that expanded because we think it is important and we want to help you make use of this 5-year study. We want to support your activity.

Dr. MCGINNIS. We will look forward to working with you in it.

Chairman GLENN. Thank you. Senator Bingaman?

Senator BINGAMAN. Let me just ask one additional question, if I could. There is some confusion, I gather, about lead agency roles and what the Department of Agriculture is doing and what the Health and Human Services Department is doing. I have been told there is language in recently passed legislation that implies, at least as read by some, that the Department of Agriculture is to take the lead role in developing these dietary guidelines. I would be interested in getting your reaction to that.

I had thought that was a joint responsibility, and I am wondering if your Department is abrogating its responsibility on this regard. What is going on with regard to responsibility?

Dr. MCGINNIS. Well, I need to emphasize at the outset, Senator, that we are not abrogating our responsibility. We in DHHS feel that we have a mandate and a responsibility to provide leadership in the development of dietary guidelines. As I noted in my testimony, dietary habits are extremely important to the prevention of disease, perhaps in the aggregate, the most important set of factors for Americans.

As a result, we have moved aggressively over the last decade to develop and disseminate dietary guidance information. I mentioned some of the activities earlier, including the Surgeon General's Report of 1979, the dietary guidelines, the National High Blood Pressure Education program, the National Cholesterol Education program, the Cancer Prevention Awareness program. Each of these are important elements of dietary guidance that we view as our obligation to get out to the public.

We have worked closely with USDA in this effort. I think our colleagues at USDA would agree to that, and to the Administration's view that these are partnership ventures. Individually they do not make claims to any special lead, but they have noted the bill report language that you referred to earlier. They have noted that they feel obliged to acknowledge that bill report language that was issued by the Agriculture Appropriations Committee that appears to place a lead for dietary guidance with USDA.

We in HHS obviously do not view that language as either binding or appropriate and hope that you and your colleagues would agree.

Senator BINGAMAN. I speak for none of my colleagues, but I certainly agree.

That is all I had, Mr. Chairman.

Chairman GLENN. Thank you, Senator Bingaman.

I have just one more. You stated that your estimate is that some 400,000 Americans died prematurely last year from dietary deficiencies—that is a lot of people—and contrasted that with 14,000 deaths from AIDS.

We are pretty well getting organized for the AIDS thing. We have the special Presidential Commission. We have a lot of interest. We have different groups being formed, a lot of voluntary groups raising money, because it is such a cataclysmic thing. If you get AIDS it is final and that is it and it is a short period of time.

But your figures are quite startling here and quite impressive and I wonder if we are satisfied that there is a comparable effort on education and research and comparable Government involvement to deal with the problem of nutritional deficiencies which, by the figures you gave, caused nearly 30 times more premature deaths than were caused by AIDS last year. How do we generate that kind of a similar interest and concern about this and are you putting any effort into that?

Dr. MCGINNIS. Well, I think we need to emphasize first that AIDS is our number one public health priority and it ought to be, not necessarily because of the level at which it is taking lives now but because of the extreme seriousness of the diseases that result from it, the personal devastation that is resultant, and the rate of increase in the problem.

So, having said that, let me now turn to nutrition, which I think ought to be given a very high priority on our national health policy agenda. Actions such as the development of the Surgeon General's Report are intended to draw out and amplify on the importance of the topic, and I would hope will lead to additional emphasis in the future.

Chairman GLENN. Doctor, we do have to move along and I appreciate your being with us this morning. There is one thing that I would like to ask for in addition, if you would submit for the record, and that is, you know most of the things that are going into this 5-year study now and the Surgeon General's Report that will be out.

When you send in the other information we asked for on the funding and how it breaks down, I would appreciate an outline, too, of how you plan to implement this, how you plan to make this report meaningful once it does come out, what use you plan to make of it, and rundown in that area.[1]

And if there are costs associated with that, fine, put those in, too. I think that is very important. We do not want to see this thing come out in midsummer—July 15th we said as a hoped-for date—we don't want to see that come out and then just be unused after all of that study. It is going to be too important for that.

So the implementation plan would interest me in particular, and I am sure, other members of the Committee.

There may be other questions that Senator Bingaman or other members of the Committee have to submit to you and we would hope that you and the other witnesses later this morning would respond to those questions so that your responses can be included in the record of our hearings.

We appreciate very much your being here this morning. Thank you very much.

Dr. McGINNIS. Thank you very much for the opportunity.

Chairman GLENN. Our next panel includes Dr. Peter Greenwald, Division of Cancer Prevention and Control, of the National Cancer Institute in Bethesda; Dr. Walter Willett, Harvard University, School of Public Health, Boston; Dr. Colin Campbell, Division of Nutritional Sciences, Cornell University at Ithaca, New York; Dr. John LaRosa, Dean for Clinical Affairs, the George Washington University Medical Center here in Washington. Gentlemen, we appreciate your being with us this morning.

Our panel will discuss the contribution of dietary factors in the induction of two very dread diseases in this country—cancer and heart disease. Both diseases are major causes of death and disability in this country with staggering economic costs attached to them. We hope the panel this morning will shed some light on strategies to lessen one's risk of developing either or both of these diseases.

Our first witness, Dr. Peter Greenwald, is the Director of the Division for Cancer Prevention and Control at NCI, the National Cancer Institute. Dr. Greenwald has been in this field for some 20 years and over the past 20 years he has conducted extensive biological and epidemiological research on environmental causes of cancer.

Dr. Greenwald, welcome this morning and we look forward to your testimony.

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[1] See p. 334.

TESTIMONY OF PETER GREENWALD, M.D., DIVISION OF CANCER PREVENTION AND CONTROL, NATIONAL CANCER INSTITUTE, BETHESDA, MD [1]

Dr. **GREENWALD**. Thank you. I am Peter Greenwald of the National Cancer Institute. I welcome the chance to discuss with your Committee NCI's guidelines on diet and cancer and, as requested, I am going to focus on what we have learned about the role of fiber in the diet.

NCI's current dietary guidance, based on reviews conducted by the National Academy of Sciences and by NCI emphasizes principles endorsed by a number of scientific bodies, including the USDA/DHHS Dietary Guidelines for Americans. The NCI guidance also reflects a broad consensus of scientific opinion for a balanced diet from a variety of food sources.

On fiber we suggest increasing fiber intake to 20 to 30 grams per day with an upper limit of 35 grams.

Chairman **GLENN**. Doctor, let me interrupt you there. What is 20 to 30 grams a day? What does that mean to people? For a housewife out there who does not know a gram from something or other, what does that mean?

Dr. **GREENWALD**. Your point of translating that to what people need to know is important. Five or six servings of whole grains, fruits or vegetables in a day—for example, a whole grain cereal for breakfast with a fruit on it would be two of the servings—would give you that level of dietary fiber.

In 1987, a study commissioned by the Food and Drug Administration concluded that adults should eat whole grain products and fruits and vegetables in sufficient quantity to provide 20 to 35 grams of fiber per day, essentially the same as NCI suggests. In 1985, a Canadian task force recommended that the Canadian population at least double its intake of dietary fiber. In 1982, the National Academy of Sciences recommended that fruits, vegetables and whole grains be part of the daily diet.

NCI also suggests that as part of the overall diet people reduce fat intake to 30 percent or less of calories, include a variety of vegetables and fruits in the daily diet, avoid obesity and, if you drink, do so in moderation.

In general, diet and cancer studies have indicated that diets low in fat and calories and rich in fiber-containing foods are associated with a lower risk of a number of cancers. Although the evidence linking diet and cancer risk is not yet conclusive, it is a sufficient basis to advise the public as the research continues.

Now I would like to go into some of the evidence on fiber. The NCI reviewed 42 epidemiological studies published from 1970 to 1987. Of these, 33 identified an inverse or protective association between dietary fiber and the risk of colon cancer; six showed no association or were equivocal; and three reported a direct association.

This is not surprising when one examines the volume and the complexity of the research. NCI recognizes that concurrence with individual study results must be predicated on careful assessment of the research design and the soundness of the conclusions.

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[1] See p. 158 for Dr. Greenwald's prepared statement.

A critical review of the major epidemiologic investigations of fiber and colon cancer was published by NCI in 1986. We found consistent evidence for a protective role in colon cancer.

For example, in Finland the typical diet is not very different from ours, except the Finnish people eat more fiber in their diet. The rate of colon cancer in Finland is less than one-third that in the United States.

A study in India examined railway employees and their families in northern regions where there is a lot of whole wheat flour and leafy vegetables in the diet as compared to southern India where the diet is low in fiber, the diet mainly coming from polished rice. This study found that colon cancer was rare in the northern high fiber area and more common in the southern area.

In Israel a study found that colon cancer patients reported eating less fiber-containing foods than did a comparison group of patients. A case-control study in Japan showed similar results. Patients with cancer reported lower levels of vegetable, mainly cabbage, intake before the onset of cancer than did control patients.

In a geographic correlation study in England, an apparent protective effect was observed. Those regions with relatively low colon cancer rate had a higher intake of fiber. A study of a black population of colon cancer patients in San Francisco showed that the colon patients had been eating less fiber and more fat than were other black patients.

Thus, we have a convergence of evidence from different research studies. International correlations, migrating population studies, time trend analyses, and epidemiological case-control studies all tend to suggest the beneficial effect of dietary fiber from a variety of food sources.

Fiber is thought to reduce the adverse effects of mutagens and carcinogens, possibly through dilution, by affecting transit time through the colon to make things pass through faster, by changing the metabolism of fecal bacteria through chemical binding, and by affecting the acidity through reducing fecal pH. These types of changes have been demonstrated in several laboratory studies and form a plausible explanation of the mechanisms by which fiber may protect against colon cancer.

In conclusion, human epidemiological studies show a common trend for fiber as a protective factor in colon cancer. The weight of evidence supports the inverse relationship between colon cancer and dietary fiber.

NCI believes that in view of the substantial evidence on fiber, it is reasonable to provide dietary guidance now as the research continues. Because of the long period for cancer induction, it may take many years for the more definitive evidence that might be provided through human prevention trials.

We expect new research to bring refinements, not reversals of this guidance. For example, in the future it may be possible to be more specific about the distinction between insoluble and soluble fibers.

Within the year, two important reports are scheduled to be released: *Diet and Health,* prepared by the Food and Nutrition Board of the National Academy of Sciences will review the scientific basis of diet in relation to chronic diseases; and the Surgeon General's report on *Nutrition and Health* will be released.

My opinion is that this first Surgeon General's report on this topic is likely to be a major milestone for nutrition. I think it is a very positive step. At that time, NCI will institute a comprehensive review of its dietary guidelines to make sure they are completely up to date and consistent with the findings of these review documents, so we will modify as new information comes in.

Mr. Chairman and members of the Committee, I would be pleased to answer any questions.

Chairman GLENN. Thank you very much, Dr. Greenwald.

We will have the testimony from each person as we go along and then have our questions at that point so we can have some interaction back and forth among you as well as our questioning from up here.

Our next witness is Dr. Walter C. Willett, professor of epidemiology and nutrition at Harvard University School of Public Health. Among his various research interests, Dr. Willett has studied the risk of developing breast cancer as a function of dietary fat and alcohol consumption.

Dr. Willett, welcome to our hearing this morning. We look forward to your testimony.

TESTIMONY OF WALTER C. WILLETT, M.D., HARVARD UNIVERSITY SCHOOL OF PUBLIC HEALTH, BOSTON, MA [1]

Dr. WILLETT. Thank you very much. I was asked to really focus my comments on diet and breast cancer, so I will do that. Of course, there is a lot more to the effects of diet than just breast cancer.

Breast cancer is, however, the most important malignancy among women since it is extremely common, often fatal, and frequently occurs at an age when the consequences are particular tragic. In these few minutes I will briefly discuss recent evidence regarding the relationship of dietary factors with this disease and offer a few suggestions for directions.

A major hypothesis that has been examined in this area is that of dietary fat and breast cancer. Until very recently it was commonly believed that breast cancer was caused by the high fat diets consumed by most Americans.

This conclusion was supported by two basic lines of evidence: first, the correlation between national per capita fat intake and breast cancer rates among countries; and secondly, by feeding experiments among animals. However, a recent series of studies have failed to support this hypothesis that fat intake increases the risk of breast cancer. I think many of you appreciate that this is a very controversial and contentious area within the scientific community and a few minutes cannot really adequately describe all the pros and cons regarding the argument.

Among the recent lines of evidence that have failed to support an association are several recently analyzed case-control studies from the United States, Canada, Australia and Japan in which no association was seen between fat intake and risk of breast cancer.

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[1] See p. 469 and p. 486 for two statements submitted by Dr. Willett.

There are many limitations to case-control studies since in these studies women with breast cancer are asked about their diet years ago before the breast cancer occurred. Prospective studies are likely to be much more informative.

There have recently been two large prospective studies reported. The first was our study among approximately 90,000 registered nurses across the United States from whom we collected dietary intake data in 1980. During the next 4 years, 601 breast cancer cases occurred in this group. If anything, there was a slightly higher risk of breast cancer in the low fat intake group. Furthermore, an analysis of the NHANES data collected by the National Cancer Institute found that women with the highest fat intake actually had a significantly lower risk of breast cancer.

Another line of evidence is that only a slight rise in breast cancer rates has occurred in Japan despite a very large increase in fat consumption since 1950. I think it is also worth noting, as was mentioned a few minutes ago, that fat intake and cholesterol intake have declined in this country and that has been used as part of the explanation for the rapid decline in coronary heart disease rates. Unfortunately, at the same time while this fat intake was going down, breast cancer rates were actually rising, without good explanation, in this country.

In another study among Seventh Day Adventists, no association with meat intake, egg intake or animal products was seen in a recently reported analysis. This study was particularly important because regular meat eaters could be compared with lifetime vegetarians and there seemed to be no benefit in being a lifetime vegetarian with respect to breast cancer risk.

Animal studies have received renewed scrutiny and can be interpreted as supporting a strong positive association between total caloric intake and mammary tumors and a weaker, or possibly no association, between the fat composition of the diet and mammary tumors. There is a very nice review recently done by Dr. Albanes in Peter Greenwald's division that found no association between the fat composition of the diet and mammary tumor risk in mice.

On the basis of available evidence it is difficult to exclude a very small association between animal fat intake, or fat intake in general, and risk of breast cancer, or an effect of greatly reduced intake early in life; however, there is little evidence that fat reduction by adult women will produce any substantial reduction in risk of breast cancer.

While I was not asked to talk about the relation of fat intake with the risk of colon cancer, the prospects of finding an effect of fat consumption on the incidence of this disease appear much more promising, although the available data are far from conclusive.

It has been commonly accepted that obesity is the cause of breast cancer and that this disease can be avoided by staying slim. The best evidence to support this comes from the very large American Cancer Society's study of breast cancer mortality. However, this association between obesity and breast cancer is really not very strong and appears to be in part an effect of delayed detection in women with fat breasts.

Studies of obesity and breast cancer incidence, in other words a first occurrence of breast cancer as opposed to mortality from breast cancer, have been inconsistent. Among our study of over 100,000 registered nurses, and in several other studies as well, the highest risk of breast cancer among premenopausal women actually occurred among the thinnest women.

Even though there may be a link between obesity and breast cancer among women who are a number of years past their menopause, weight reduction is unlikely to provide an important practical means of breast cancer prevention, both because of the relatively weak association, as well as the difficulty in achieving sustained major reductions in weight.

However, there is something new in this line of investigation. Quite unexpectedly, a substantial body of recent evidence suggests that even moderate intake of alcoholic beverages may increase the risk of breast cancer. A positive association was noted in four published prospective studies. A clear dose-response relationship was seen in our study about 90,000 U.S. nurses. Those women consuming one or more drinks per day of beer, wine or liquor were at about a 50 percent greater risk of breast cancer than women who drank only occasionally or not at all

A similar positive relationship was also observed in the NHANES follow-up study and in two prospective studies conducted among members of the Kaiser health plan.

Chairman GLENN. Let me just interrupt there one second. What was the incidence, if you can—because I think this is important—was the normal incidence without considering alcohol. Was this like one hundredth of 1 percent chance of having breast cancer and it increased to one and a half hundredths of 1 percent, or was this like you had 3 percent and it went up to 5 or something like that? This would be a very substantial difference.

Dr. WILLETT. Right. What is really most meaningful to look at is, I think, the cumulative risk of breast cancer up to different points in life. And if you look at risk of breast cancer say up to about age 60, among the non-drinkers it can be calculated at about 3 percent and among the drinkers of more than one drink per day, it is about 5 percent; just about the numbers you indicate.

If you project those numbers up to age 75, it becomes something more like 7 percent risk of breast cancer versus 11 percent for drinkers.

Chairman GLENN. It is a very substantial difference, then.

Dr. WILLETT. Yes.

Chairman GLENN. In actual numbers; not just percentages but in actual numbers of people. It is a very substantial increase.

Dr. WILLETT. Right. Because this is such a tremendously important disease, it has major potential impact. Even small increases in risk are potentially very important for a disease of this seriousness.

Chairman GLENN. Thank you. I did not mean to interrupt. We will take this off my time later on. Go ahead.

Dr. WILLETT. In addition to these prospective studies, a positive association was seen in 8 of the 12 published case-control studies and in all of these studies this association with alcohol could not be explained by any of the known causes of breast cancer. In one important study conducted by the National Cancer Institute, it appeared that the effect of alcohol was limited to use before the age of 30 years. While these studies about alcohol and breast cancer are not completely conclusive, they do strongly suggest that alcohol may increase the risk of breast cancer.

In future studies it will be particularly important to examine the effect of reducing the alcohol intake among women who are already in middle age. If the observed association with alcohol intake represents cause and effect, then alcohol could explain 10 to 15 percent of the breast cancer in this country, which would be an important proportion of the disease but still leave very much of the disease unaccounted for.

Just a quick word about Vitamin A and breast cancer. There is a considerable body of evidence that suggest that preformed Vitamin A, or its vegetable precursors may reduce the risk of certain malignancies, particularly lung cancer. Vitamin A has been examined in only a few studies of breast cancer. In two case-control investigations, an inverse relationship was observed, meaning the higher the Vitamin A or carotene intake, the lower the risk of disease.

This lead needs to be pursued; in particular, it will be important to distinguish between plant and animal sources of this vitamin.

I would like to comment briefly about energy restriction and breast cancer. The striking international differences in breast cancer rates, often as high as 10-to 15-fold differences between countries, have intrigued epidemiologists for decades and today still remain largely unexplained. Many possibilities exist, but these are largely speculative and it is quite possible that no single factor will be identified.

A leading hypothesis is, however, that energy—caloric intake—restriction during growth and development that is sufficient to cause stunting and reduced adult height will decrease the risk of breast cancer. This hypothesis is very strongly supported by the animal literature where even moderate restrictions lead to very dramatic reductions in mammary tumors.

Even simply plotting average height against national rates of breast cancer provides a picture similar to that relating fat intake with breast cancer rates. However, even if this hypothesis is true, it does not provide directly a practical approach to breast cancer prevention.

In conclusion, we still know very little about the causes, dietary or otherwise, of breast cancer. Secondly, we do not have any practical proven method to prevent breast cancer. However, mammography will reduce mortality from breast cancer.

Third, the reduction of alcohol intake may have a modest but important effect in decreasing breast cancer but further work on this topic is warranted.

Fourth, other dietary factors, as Vitamin A, need to be examined carefully.

I have just a few general comments about the area of nutrition research. While one is contemplating larger resources for national surveys, it is important to realize that we already, I think, know much more about what the U.S. population eats than we do about the consequences of what we eat.

Therefore, while monitoring of population intake needs to be continued and refined, my perception is that future emphasis needs to be given to studies of the relation between diet and disease, which are still, I think, rather poorly and vaguely defined. I found it a little distressing this week to see our ongoing study of this topic was cut by 11 percent, along with other NHLBI continuing projects.

Many answers to our current questions about diet and disease will be available during the next 5 to 10 years from the prospective studies already in place. Aspects that deserve enhancement are increasing the number of men being followed, greater use of biochemical indicators of nutrient status, and establishment of a large cohort of children to be followed for a lifetime if we really want to learn about the long term consequences of diet. That would require a new and different arrangement for supporting such a long term investment.

Chairman **Glenn**. Thank you very much, Dr. Willett. We will want to get back with a lot of questions in that area, I am sure, in a little while.

Our next witness, Dr. Colin Campbell, holds the endowed chair of Jacob Gould Schurman Professor of Nutritional Biochemistry at Cornell University. His research over the past 25 years has focused on the role of dietary and nutritional factors in the onset of cancer in human and animal studies. He is a coauthor of the 1982 National Academy of Sciences report entitled "Diet, Nutrition and Cancer."

Dr. Campbell, welcome to our hearing. We look forward to your testimony.

TESTIMONY OF T. COLIN CAMPBELL, PH.D., JACOB GOULD SCHURMAN PROFESSOR OF NUTRITIONAL BIOCHEMISTRY, DIVISION OF NUTRITIONAL SCIENCES, CORNELL UNIVERSITY, ITHACA, NY [1]

Dr. **Campbell**. Thank you, Mr. Chairman. In addition I would like to point out, because I will come back to this point later on, that I presently direct a series of studies on the causes of human disease in The People's Republic of China, which includes as principal institutions the Chinese Academies of Preventive Medicine and of Medical Sciences, the University of Oxford and Cornell University, in addition to approximately 20 other participating laboratories.

I have been asked to comment more broadly on the effect of diet and nutrition in the induction of chronic diseases. I begin by considering the instruction that I think that we get by considering its recent history.

Twenty-five years ago there were few of us interested in the possibility that improper nutrition might cause cancer, or at least play a role in the causation of cancer. Although interest in this subject has grown exponentially, understanding has been much slower. In contrast, studies on diet and heart disease have been in some ways more productive.

It is known, for example, that blood cholesterol is strongly associated with disease risk; that high levels of blood cholesterol in the United States are not normal, as was once thought; that cholesterol deposits along the walls of blood vessels are chiefly responsible for the onset of the disease; and that consuming diets high in saturated fat is predictive of disease.

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[1] See p. 193 for Dr. Campbell's prepared statement.

Diet heart disease recommendations are now reasonably well accepted. In contrast, research on cancer and diet was only beginning to gain momentum during the 1960s and 1970s. Chemical carcinogens were being discovered in animal studies and dietary fat and fiber were being associated with selected human cancers.

Two lines of investigation were emerging, one concerned with specific chemicals, the other with nutrients. Thus, by 1980 a large number of ideas had surfaced about food, nutrition and cancer. So it was with a mixture of healthy skepticism, I think, but yet hope, that the National Academy of Sciences in 1980 attempted to sort out what had become a rather confusing state of affairs.

After 2 years of intensive study, a panel of scientists, with unanimity of opinion I might add, recommended increased consumption of fruits, vegetables and whole grain cereal products and set fat intake at a reduced level of 30 percent of calories as a practical target to shoot for.

Unfortunately, since that time further understanding of this field has been rather disappointing because the general recommendation on food patterns has eroded back into narrowly defined bits of information on specific foods and specific nutrients. This practice disintegrates, in my view, the in-context overview into out-of-context fragments. It trades, if you will, the horizontal interpretation of the data for the more vertical interpretation.

The general message is of great importance and is simple. In contrast, detailed information out of context is terribly confusing and misleading. In my background paper I consider some contemporary dietary recommendations which I think illustrate these difficulties.

In contrast, these examples also coincide with an exciting message on nutritional prevention of chronic degenerative diseases. They illustrate the central role that nutritional science ought to play in the practice of medicine in the United States but does not, as our Chairman has indicated. These illustrations include issues such as cholesterol labeling of food and recommendations to consume more calcium, more Vitamin A, less fiber, more unsaturated oils and less saturated fat.

In my opinion, much of the unfortunate confusion about nutritional guidelines in chronic disease risk is directly attributable to the inappropriate use of narrowly focused scientific data. Too many consumers believe in magic bullets, corporations in profit-rich products with very specific health claims, research scientists in molecular mechanisms as their basis for policy, and regulations managers in very precise numbers as a means of decision making. Along the way, promotion of long term health is sacrificed. If this practice continues, even more confusion and controversy will occur in the future.

Detailed data are now being produced at a rate so great that evidence can be found to support almost any hypothesis if one so desires. When our vision is too closely focused on detailed data, contradictions abound. To avert this crisis, in my view, I would suggest the following:

First, a high quality scientific body such as the National Academy of Sciences needs to regularly review and report on dietary and nutritional data related to the ideology of the so-called "diseases of affluence" such as cardiovascular disease, cancer, diabetes and osteoporosis, to give some examples.

We must turn our attention to the role of nutrition in these diseases and away from, to some extent, the nutritional deficiency diseases so long studied but of much less significance in the United States. I believe the simultaneously minimization of both kinds of diseases should eventually become possible.

Secondly, large scale human studies are needed to permit comprehensive analysis of diet, nutrition and disease relationships. I envision two kinds. The first would examine prospectively a very large nationally selected cohort of people representing diverse dietary practices. This could, of course, well be the NHANES-3 study planned for later this year.

The second study would examine the health consequences after people changed their diets according to these new recommendations. This study would be similar in design but much more comprehensive in concept than the recently suspended dietary fat breast cancer intervention project.

American dietary habits are markedly different from contemporary recommendations to consume a very plant-enriched diet, and we need to carefully examine doubts concerning these recommendations.

Aside from my background in basic research on nutrition and cancer, I also come to these views from my continuing experiences in The Peoples Republic of China where we have, with our Chinese and British colleagues, embarked on a series of very large surveys of diet and disease relationships. The first survey in 1983 studied in detail dietary and lifestyle practices in 130 mostly rural Chinese villages located in 65 counties across the country.

These data are being organized to determine the associations of dietary and lifestyle characteristics with the highly localized patterns of disease in different parts of China. This and additional studies now ongoing or being planned emphasize the totality of dietary, nutritional and lifestyle factors upon the ideology of all diseases so that specific observations can be placed in context.

A few preliminary results from this study might illustrate the value of study in diet-disease relationships in the context of different diets, different diseases and different cultures. Adult Chinese plasma cholesterol levels range from about 90 to 175 milligrams per deciliter. Chinese highs are near U.S. lows.

Thus, with these data we can determine whether a downward trend in plasma cholesterol below 180 milligrams per deciliter is also associated with a downward trend in cardiovascular and other degenerative disease rates or whether, for example, colon cancer actually increases, as was suggested by a few case-control studies in the United States. Indeed, in China both diseases—that is, both the cardiovascular diseases as well as colon cancer—decrease with lower levels of plasma cholesterol.

Energy intake standardized for body weight is about 20 percent higher in China than the United States, yet there is very little obesity amongst Chinese. This finding tells us that excess caloric intake does not necessarily cause excess body weight.

Similar observations have been in the nutrition literature for at least a 100 years. It is only of late that some non-nutritionists are beginning to discover them. Thus, the Chinese data give new insight into the dietary experiences of Americans, and I might add, into our own misunderstood history of nutrition research.

Excepting one county, fat intake in China ranges from a low of about 6 percent of calories to a high of 25 percent, with an average of around 15 percent. The Academy recommendations of decreased fat intake to 30 percent would still leave us twice as high as the average Chinese.

Chinese fiber intake averages 34 grams a day, ranging as high as 77 grams a day. Average U.S. intake is around 10. The NCI recommendation to increase intake to 30 grams a day appears modest. Concerns have been expressed that a high fiber intake might compromise mineral status. However, this concern is not borne out by the Chinese experience.

These observations are but a few of those which will eventually become possible from this and future studies in China. In a word of caution, I am very much aware that with a data base as large as this it will be possible to select various interesting associations to support a particular point of view, including my own. For this and other reasons, the Chinese have very kindly offered these data in their original data form so that all investigators can review and interpret the results from their various vantage points. The Chinese and British have also provided major funds for this project.

In conclusion, I can hardly overemphasize the importance of nutritional and dietary practice as a cause of American diseases of affluence. These diseases account for more than three-quarters of premature U.S. mortality and the evidence of a nutritional link, however fragmented it appears to be, is none the less impressive when examined comprehensively.

In my view, we are sitting on gold yet to be mined. Dietary and nutritional advice, coupled with assertive recommendations against smoking, should mean major savings in health care costs. I am sure that we all appreciate your continued assistance of the NIH programs to further develop reliable and unbiased research and public information programs. Otherwise, as consumers we are too often parceled out bits of fragmented information by those with vested interest to capsulize or to protect.

I commend you for raising public consciousness on this matter. I would be pleased to answer questions at the appropriate time.

Chairman **Glenn**. Thank you, Dr. Campbell. Thank you very, very much and we will get back to some of those things in a few moments here.

Our next witness is Dr. John C. LaRosa, Dean for Clinical Affairs and Director of the Lipid Research Clinic at the George Washington University Medical Center. He is currently serving as Chairman of the Nutrition Committee of the American Heart Association. He has a continuing research interest on the role of dietary factors in cardiovascular disease and lipid metabolism.

Senator **Sasser**. Mr. Chairman, if I might interrupt, before Dr. LaRosa begins, I have got four Committee hearings going simultaneously, as I explained to the Chairman, and I would ask unanimous consent that I be allowed to submit some questions for the record if I should choose to, Mr. Chairman.

Chairman **Glenn**. You certainly will be. Do you have any questions you want to ask right now, Jim?

Senator **Sasser**. There is one question that I would like to direct to Dr. Willett just very quickly if I may.

In your re-examination of animal data, would you begin to conclude that a diet of Omega-3 fatty acids found in fish would inhibit the growth of carcinogens in humans? And would a person actually have to eat fish, or just include the Omega-3 fatty acids in the preparation of their food?

Dr. **Willett**. There are some fairly exciting data from animal studies to suggest a protective effect of fish oils given to animals, but the relevance to humans is still quite uncertain. It is a lead that needs to be followed up in human studies, but there really are no direct human data on this topic at this point in time. So I think it would be premature to recommend it to people.

I think your point that one has to be careful about the distinction between just consuming refined omega-three fatty acids and actually eating real food products which may contain a lot of other protective factors in them as well. So one really has to keep those clearly distinguished. But for the moment it is a very interesting and important research topic. I think it is premature to recommend anything to people.

Senator **Sasser** [presiding]. Thank you, Dr. Willett.

In the Chairman's absence, I want to congratulate and commend him for convening these very important hearings. I think the testimony that is developing this morning is very important. I would like to add my word of thanks to the Chairman for convening the hearing and to this distinguished panel for appearing.

And Dr. LaRosa, you may continue and my apologies to Senator Bingaman for interjecting myself here.

TESTIMONY OF JOHN C. LaROSA, M.D., DEAN FOR CLINICAL AFFAIRS, THE GEORGE WASHINGTON UNIVERSITY MEDICAL CENTER, WASHINGTON, DC

Dr. **LaRosa**. Thank you very much. It is a pleasure to be with you this morning.

I am serving currently as Chairman of the American Heart Association Nutrition Committee. I do wish to say, though, that not everything I have to say nor everything in my written testimony necessarily reflects a policy position that has been taken by the American Heart Association and I am here in the capacity as an investigator in this area and a private citizen.

I did submit, of course, some written testimony.[1] I am going to, with your permission, Mr. Chairman, briefly paraphrase that. As part of the testimony that I have submitted, I have divided some common nutritional issues into three categories: Those in which I believe there is a fairly widespread consensus that we have the scientific data; second, those in which there is a considerable amount of data but not a broad consensus; and third, issues where there is a good deal of discussion, in some areas discussion based on very preliminary data, in other areas discussion based on popular books or popular notions without very much science at all to back it up.

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[1] See p. 208.

I think it is important to make that kind of distinction because the public, and to some extent even the medical and scientific community, sometimes do not have the capacity to make such distinctions.

Very briefly, under those issues—and these are issues primarily related to diet and heart disease—under issues in which there is a broad consensus, we have already heard from several other panel members this morning that the dietary fat and cholesterol content of the diet raises the blood cholesterol level and that in turn is related very clearly to increased rates of the disease we call atherosclerosis, which affects primarily or principally the coronary blood vessels, the blood vessels that supply the heart itself.

There is also, I believe, a broad consensus that ingestion of polyunsaturated fats as found in common vegetable oils like corn oil, safflower oil, lower the blood cholesterol level, in particular, that fraction of cholesterol called the low-density lipoprotein, or LDL cholesterol, which is most clearly associated with atherosclerosis.

In fairness, there are some investigators who feel that it is not the effect of polyunsaturates themselves that is so important, but simply the fact that when individuals take in polyunsaturates, they generally substitute calories that otherwise might be taken as saturated fat. And that is an issue that comes up again and again in these debates. But I think there is a general consensus that polyunsaturated fat lowers cholesterol levels.

You also heard about caloric intake. I think we are all in agreement that Americans eat too much, that obesity is not an inevitable consequence of aging and that we have a particular problem with our children, although I am not certain it is entirely related to caloric intake. It may also be related to less activity, but I will leave that to other panel members more expert.

There is a broad consensus that we all take too much salt and that we could all profitably reduce that and therefore reduce in the population the burden of high blood pressure.

There may not be quite such a broad consensus that we all drink too much alcohol. But in fact, it was surprising to me to learn that on the average, Americans take 5 percent of their calories as alcohol. And among individuals who take alcohol regularly, 10 percent of their calories are taken as alcohol.

I find that to be a somewhat shocking figure. We are developing increasing evidence that alcohol intake is associated with high blood pressure, in addition to the many, many other diseases not directly related to cardiovascular disease, that alcohol causes.

Under issues in which there is a considerable amount of scientific data but which are still controversial—and again, I am referring basically to their relationship to heart disease—first is the ingestion of fish oil or fish. I think it is probably fair to say that what we know for sure is that populations that ingest fish—not necessarily fish oil, but fish—have lower rates of coronary disease, and whether the two are related to one another is less clear. Certainly, whether or not the ingestion of fish oil capsules is beneficial in any way is still very much an undecided issue.

There is also some considerable enthusiasm to the effects of monounsaturated fats, that is, those that are found, for example, in olive oil because despite the fact that populations in the Mediterranean basin eat almost as much fat as a percent of total calories as we do, their rates of heart disease are lower and there is some suggested evidence that the fraction of cholesterol that is most related to the development of atherosclerosis, that is, again, LDL, may be lowered by ingestion of olive oil.

In both the case of fish oil and monounsaturated fat, though, I believe there is not sufficient evidence to make widespread dietary recommendations.

As far as fiber is concerned, I think there is little debate any longer that there is benefit. Some of the debate that is related to heart disease is related to which kinds of fibers might be most beneficial and whether or not from a practical point of view we can take in enough to make a real difference.

It does seem to be clear that soluble fibers such as are found in oat bran, psyllium, which is a natural product but one which is found in a lot of commercial bulk laxatives, and guar and pectins found in fruits and vegetables, that these kinds of fibers do lower the LDL cholesterol level in the blood, although probably to modest degrees in the quantities in which we are likely to be able to take them practically.

Then, again, there is a new and I think exciting area of research in looking at other minerals, in addition to sodium, such as calcium, potassium and magnesium, on their affect on blood pressure. Again, these are areas that we have a considerable amount of interest in, lots of data, but not enough, I think, to make scientific recommendations.

There are also some policy issues that I put under the general group of controversy. One is, despite the fact that we have had almost unanimous opinions voiced that the entire population needs to change its dietary habits—and I concur in that personally and the Heart Association has been recommending dietary changes with lower saturated fat and lower cholesterol intake for at least the last 20 years—nevertheless, it has to be said that there are individuals, some of whom are quite reputable in the scientific community, who feel that the entire population should not have to do that; only those individuals with cholesterol levels that are at risk.

I personally find that a hard position to understand when we say that 25 to 50 percent of the population may be at risk. It is hard for me to conceive how we will change their diets without changing everyone's.

There are real controversies related to whether dietary change in children might adversely affect growth and development. As Chairman of the American Heart Association Nutrition Committee I had the opportunity to participate in a joint meeting with the American Academy of Pediatrics Nutrition Committee last September.

It was a meeting that was at some times even raucous and I do believe that we came to the general conclusion that we were not as far apart as we thought we were, but the American Academy of Pediatrics has taken a somewhat more conservative position because of the concern of some of its members that diets which are radically low in fat, which is not the case of the American Heart Association, might adversely affect growth and development.

Finally, there are issues about what we should do about diet and the elderly where there is some concern that depriving elderly patients of the protein that might be found in dairy products and eggs, which are inexpensive sources of high quality protein, might not be beneficial. Again, my personal answer to that is it is quite easy to separate the fat from the protein in those products and provide them.

Finally, there are issues in which there is a lot of discussion; one might say lots of heat but not a great deal of light. Periodically, quite frequently, actually, patients ask me about whether or not they should be taking lecithin. There is no reputable scientific evidence that lecithin is beneficial in preventing heart disease or in affecting cholesterol levels.

There is currently a popular book on the market which recommends gram quantities of niacin as a way of reducing blood cholesterol levels. There is no question that gram quantities of niacin do that. Gram quantities of niacin should be regarded as drugs. And just because you can buy niacin in the health food stores does not mean that that is a practice that we should endorse. In fact, it is quite dangerous for people to be taking medication without the supervision of a physician.

There is some renewed interest in antioxidants, which are generally materials which act on LDL and stop it from being deposited in the walls of blood vessels. This is brand new research but it may reinvigorate our interest in things like Vitamin E and Vitamin C. Again, very, very far from being applied in terms of public health recommendations.

There is the very important issue of artificial fats which are now beginning to appear. Sucrose polyester, textured milk and egg white proteins are beginning to appear as low calorie substitutes. I have great concern that we do not have legislative control or regulatory control over these kinds of substances and we may find ourselves with very dangerous materials, not adequately tested, being introduced widely into the food chain.

Finally, there is the issue of trace elements which periodically someone introduces, and the only reason I mention it is not because it is necessarily bad research, but simply because I do not think that the serum cadmium level ought to be placed on the same level of importance as the serum cholesterol level, and frequently the popular press does that sort of thing and we all get a rash of calls as to the possibility that there might in fact be some magic bullet out there.

I did include in my testimony, and I think it is worth just listing very briefly, some of the kinds of guidelines that epidemiologists use when they try to decide whether there is a cause and effect relationship, because, in fact, what we struggle with all the time is the issue of how do we decide when we have gotten to the point where we should be making public health recommendations, and some of the issues that are useful to consider—and there are many people testifying here who can go through these in a much more learned fashion than I can—are the strength of the association.

That is, is there a dose response? Or, the more you take, the more likely you are to get the disease? Is there a consistency in the association between the dietary factor and the disease? Is there a temporal plausibility? That is, did the ingestion of the dietary factor precede the development of the disease? It would be hard to imagine that you would assign cause and effect if the dietary factor followed the onset of the disease.

Is there specificity in the relationship? And is there a biological plausibility? That is, is it likely from what we know that such a dietary factor would be expected to cause such a disease?

None of these are iron-clad rules. All of them are subject to interpretation, but they are useful in trying to decide at what point we have gotten to the point where we can make public health recommendations.

In closing, I just wanted to make a pitch for the need when we make recommendations to make then quantitative. It does very little good to say to somebody, lower your fat intake, if you do not give them any sort of target or guideline for it.

And while we are all nervous about doing that, because we all recognize that these are sometimes very arbitrary guidelines, I would like to quote from a distinguished epidemiologist who wrote 20 years ago the following about that sort of thing.

This is Dr. Bradford Hill: "All scientific work is incomplete, whether it may be observational or experimental. All scientific work is liable to be upset or modified by advancing knowledge. That does not confer upon us the freedom to ignore the knowledge we already have or to postpone the action that it appears to demand at a given time."

Thank you very much.

Chairman GLENN. Thank you very much, all of you. Those were all excellent statements and we could spend all day here with any one of you and profit from it.

I am sorry our time is so short this morning. You obviously have prepared well for this and have a wealth of experience and I wish we had more hours here to go into it.

We will stick with the 5 minute rule here again this morning, too, so we can kick this back and forth a little bit.

Dr. Greenwald, to start off with you again here, could you talk a little bit about soluble versus insoluble fiber and what you know about that. My understanding is there is quite a difference, from what you said and from what I read in your testimony last night, your longer statement.

What are the differences there and how do we know what to eat that has which and which?

Dr. GREENWALD. About three-quarters of our diet has insoluble fibers in this country, and that includes cellulose lignin, some of the hemicelluloses and sometimes the pectins. It is hard to separate that into simple foods because foods that have fiber tend to have more than one type.

People tend to think of insoluble fiber when you say fiber. The cereal and whole grain fibers have more of the insoluble type of fiber. The fruits, and to some extent the vegetables, have more of the soluble type of fiber. Also, there are additives in the food supply that come from algal polysaccharides or different gums, which are classified with the soluble fibers.

At this point, we recommend eating a variety of foods that are high in fiber. Our information comes from studying people who ate their foods from a variety of sources; therefore, our recommendations have to do with eating food from a variety of food sources.

If you just increase the whole grain, vegetables, fruits and legumes, the peas and beans you eat, you will be getting the high fiber foods.

Chairman **Glenn**. This may be a silly question and if it is, just dismiss it, laugh, and we will go on to the next one. But can you overdo the fiber? Do you get some bad effects if you do? Let's say I went home and I really went into this fiber thing in a big way and I am concerned about cancer. Can I overdo it? Does that cause other problems?

Dr. **Greenwald**. Yes. I think all of us would agree that there is an importance of balance and variety. NCI recommends an upper limit of 35 grams. Right now, the average citizen in the U.S. eats about 11 grams of fiber per day. So we are saying double it to 20 to 30.

You can go overboard, and there could be problems of binding of minerals like iron and calcium if you get up to huge amounts.

Chairman **Glenn**. Do high levels of fiber intake reduce other trace elements in the body or other necessary chemicals over a period of time that could cause other problems?

Dr. **Greenwald**. There is some adaptation and we have not seen many problems of this sort. Unfortunately, there are not a lot of long-term studies. But there is a possible problem if you really go to extremes. We certainly do not recommend getting over the upper limit of 35 grams.

Chairman **Glenn**. Dr. Willett, you mentioned an 11 percent decrease in funding. How does that square with what Dr. McGinnis said about continuing increases in nutrition research funding?

Dr. **Willett**. I am not an administrator so I do not know exactly how that came about, but apparently, among other people who have continuing NIH grants from the National Heart, Lung and Blood Institute this year, we were funded at 11 percent less than had been approved by the review committees initially, and the council itself.

When you are conducting a long term continuing study where you have a lot of fixed costs, for example, a lot of our costs are paper, postage stamps and things like that, that we do not have any control over, an 11 percent decrement out of the blue is quite a bit.

I just say that on the part of not just myself, but I think everyone else in the research community finds that kind of discontinuity a little bit difficult.

Chairman **Glenn**. The absolute worst thing in research and we have it come up again and again and again, whether it is nutritional research or NASA or energy research or whatever it is in Government, is the on and off. People think you can go up and down year by year and turn a program on and off. It has come up repeatedly before this Committee.

If there is one thing the research community needs is the constancy of it. You would rather put up with a little less overall if you know that it is going to be a constant funding through the years so you can plan your program.

Well, I will not give my 3 hour speech on that subject this morning.

Dr. WILLETT. Amen.

Chairman GLENN. But we have gone into it repeatedly in here. It went back to one day David Stockman—well, I will take an extra 30 seconds, too—one day David Stockman, back when he was still in Government, sat right at the table right there where you are now and I was questioning him on something on research. And he said, well, we plan to cut it this year because we have to this year, but we hope that the economy is good enough we can put it back in next year.

It was some basic research project, and I went through the ceiling on it. I lost my cool that day completely. You know, you just cannot do that kind of thing. You spend years and years and years, as you know, putting together labs and people in the studies and getting all the subcontracts farmed out to everybody under the sun. You turn it off one year and you will spend another 5 years putting it back in again.

I did not mean to give you a speech.

Senator Bingaman, go ahead.

Senator BINGAMAN. Well, it is a good speech. I liked it. Let me ask a few questions.

Dr. Greenwald, you were saying that on fiber, NCI now considers it appropriate to provide dietary guidance on the amount of fiber needed for a proper diet.

Dr. GREENWALD. Right.

Senator BINGAMAN. How does the average citizen find that out? How is that guidance provided?

Dr. GREENWALD. First of all, we provide guidance in the context of an overall diet; that is, cut down on fats, cut down on calories, eat more fiber.

We do try to coordinate and work with other parts of the Federal government and the private sector. We have an Office of Cancer Communications and we have a network across the country where people can get information. So there is an effort at public information.

We also have some research going on, one small proportion of our prevention the research, that is focused on how the public can best learn. For example, we know that when people go into a food market, they decide on about 60 to 80 percent of what they buy when they are in the market. They do not go in with a list. So there is a study with one food market in the Washington, DC area about what affects buying behavior. If you add on a shelf label, or information at the point of purchase, does that affect buying behavior?

There is another side of the picture, though, which I think is very, very important. It goes beyond education. It is what drives the food supply and purchasing. A lot of it has to do with demographics. For example, we now have more single parent families, more families with both parents working, more elderly. That has an effect on industry reacting to producing more fast foods because people want them; more fast food restaurants, microwave or quick-prepare foods.

So, it is important that we work with groups like the Department of Agriculture and industry to assure that there are food choices there that have within them our ideas of what is good for health, and at the same time, we work with the public on education.

Senator **Bingaman**. I am concerned. Dr. Rubin came out with a book, "The Save-Your-Life Diet," 10 years ago, or 12 years ago, saying we ought to eat more fiber. I am sure there are other things in that book that probably are inaccurate or improper, and that may not have been the first popular book on the subject.

But it has amazed me how little that basic information has penetrated and actually affected the dietary habits of the American people. Most people still eat white bread—white rice, to the extent they eat rice.

Dr. **Greenwald**. Right. It is a problem, Senator. We do have an educated part of our society, where there is a lot of health awareness. At the same time, we have something like 13 million illiterate persons and perhaps twice that many that do not have a high school education. We have people in different economic situations, and it is a problem figuring out how to help the whole society to benefit from the new information.

That is why I would agree, for example, with Dr. LaRosa's comment about putting quantitation into recommendations. It is not easy to get agreement amongst nutritionists on that. It is easier for us to just agree on something that is mushier. But I think quantitation helps people to get a handle on it.

Senator **Bingaman**. Dr. Campbell, who is funding the survey that you are doing in China?

Dr. **Campbell**. NCI provided the initial funds and the major funds in this country.

Senator **Bingaman**. Is NCI funding that extensive a dietary survey in this country?

Dr. **Campbell**. No, not to my knowledge.

Senator **Bingaman**. I wonder why?

Dr. **Campbell**. Not that particular kind of study.

Senator **Bingaman**. I wonder why we would give a higher priority to funding a dietary research survey in China, which I certainly support; but why would that be a higher priority than funding such a survey here?

Dr. **Campbell**. Well, let me first point out that the amount of funds that were really provided by the NCI in the beginning were extremely helpful to get this study started but from that time onwards the Chinese themselves have, according to our estimates, provided somewhere around 500 to 600 man years to this project. The Chinese government, in fact, just contributed major funds to the project.

I, too, am interested in this kind of study being conducted in this country as well and that is, in fact, why I have mentioned specifically a prospective study organized perhaps somewhere along these lines.

Senator **Bingaman**. Is there anything to keep NCI from doing that study here at this time? Could NCI do some comparable study in this country right now, if they considered it a priority?

Dr. **Campbell**. Well, the specific study that I referred to at the present time is a so-called ecologic study where we are looking at patterns and relationships between what occurs in different regions in so far as dietary habits and disease characteristics are concerned.

We cannot do that kind of study here, in large measure because we do not have this localization of disease patterns in this country. We are a rather homogenized group of people and we get our food from various and sundry places. We move all over the place, so we simply cannot do that kind of study here.

Senator **Bingaman**. But some of the other kinds of studies you recommend in your testimony could be performed here by NCI if they considered it a priority?

Dr. **Campbell**. Yes, of course.

Senator **Bingaman**. I guess I am about out of time. I will just stop and let you ask some questions.

Chairman **Glenn**. Dr. Greenwald has been jumping around like a drop of water on a hot stove over here to get in an answer to that same question here. He is from NCI.

Dr. **Greenwald**. First of all, I think that Dr. Campbell's studies are superb. China does present a unique opportunity, a widely varying set of diets across the country with widely varying frequency of cancer, but with stable populations over many years. So it is a very important study.

NCI also supports dietary surveys in the United States. We generally do it by cooperating and providing some support to the National Center for Health Statistics in their Health and Nutrition Examination Survey or Health Interview Survey.

NCI has a large research agenda in nutrition, not that there are not unfunded research opportunities. But we do have a large agenda at this point, about $50 million per year; and a related area called chemo-prevention, that focuses on human intervention trials, cancer prevention trials.

Chairman **Glenn**. Dr. LaRosa, you implied, at least, or you indicated some concern that we are getting into such specialized areas of food research, or there have been some studies in these areas, that they may have other side effects, perhaps, if I understood what you said properly, and that led me to wonder, are we getting this down to a fine enough type investigation some of these days that we are going to have to go to something like FDA, only on the nutrition side where we are going to have to clear certain diets or certain things that are liable to cause people difficulty if they do them?

We do not regulate things like that now, but is that something that is going to have to be done some time? I never really had thought about it until you mentioned it this morning.

Dr. **LaRosa**. Well, my concern, actually, Senator Glenn, is with what I think are going to be a growing number of products that are synthetic foods or foods that are produced from natural food but reprocessed in some way. You know, periodically these things make the news.

My concern is that those things have the capacity to diffuse widely into the food chain without any regulation, although I am not certain that there are no regulations. I think, in fact, the last of these is currently under consideration and the FDA is trying to decide whether it has sufficient power to regulate it at all.

But the idea that you can retexture a food or chemically construct an artificial food and then put it on the market without any or minimal testing, I find very disturbing and I do not believe that currently the regulations exist to treat those kinds of substances in the same way that drugs are treated, and I believe they should be.

Chairman GLENN. What do the rest of you think? Are you concerned about that or do you think this is a worry we can leave to the future? Any of you? Dr. Greenwald?

Dr. GREENWALD. There are certainly changes in the food supply that are going to be dramatic. They have been dramatic, in the past 10 or 15 years, if you look at the food products now as compared to what they were.

It is important that we keep ahead of the change with research. I think there will be some major benefits but also I think prudence is on the side of being sure things are well tested.

Chairman GLENN. Dr. LaRosa, again, I too was surprised that figures show that 5 percent of our caloric intake is from alcohol. That is a rather surprising figure to me. I would not have thought that. Does it figure out that way when we estimate our total caloric count for the whole country?

Dr. LAROSA. Yes.

Chairman GLENN. And then you take the whole alcohol consumption and you put them together; is that the way that figure is arrived at?

Dr. LAROSA. That is correct. Clearly, there are some people at the end of the spectrum who skew those results. Nevertheless, as an average, that is a lot, I think. It is a little bit scary.

Chairman GLENN. Do we have estimates on what that compares with in other countries?

Dr. LAROSA. I do not.

Chairman GLENN. Does anyone?

Dr. CAMPBELL. It is much lower in China, I can say, on the basis of the information we have.

Dr. GREENWALD. Alcohol consumption is higher in France, which has a somewhat lower breast cancer rate than the United States.

Chairman GLENN. Higher where?

Dr. GREENWALD. France.

Chairman GLENN. Dr. Campbell, I was very interested in your PRC investigations out there. We have, on a different area in this Committee, looked into some of the gerontological studies and the aging studies, the elderly studies, worked with Dr. Bob Butler who was head of the National Institute of Aging.

He has two of these international conferences called "The Graying of Nations," looking not into nutritional things in particular but looking into nutritional matters in connection with other gerontological studies. We have met with that group and the Chinese came through on that. We had Dr. Ma, who is in charge of their gerontological studies for the PRC, and got into some of the nutritional things there.

Do you think that in this area of the things that you are running into in your studies out there, are there such things that could be overlapping into the nutritional field, such as just plain gene differences between ourselves and the Chinese or things like that that shade this or that we have to take into consideration? Or is this pretty purely nutritional things that if applied to our population here would have a direct correlation without regard to gene differences or anything else?

Dr. CAMPBELL. This is a question that we have in fact begun to study and we do have new studies being planned just to try to segregate out this so-called gene effect or cultural difference from the dietary difference.

My own bias suggests that the dietary effect is really very substantial compared to the gene effect. I would suggest, for example, that the Chinese since 1950 have become larger during the last 30 years, quite substantially so. And so they tend to change, of course, their overall height and weight. And other evidence from other countries, too, suggest that as nutritional patterns change people, of course, change their rates of growth and there are changes in disease status.

So I would think that the gene effect, the cultural difference, is not nearly so significant as the dietary or environmental effect.

Chairman GLENN. Have you noted any difference in cancer, for instance, in those who are now taller and heavier than their predecessors? And I am coming back to Dr. Willett's studies or his comments that would indicate that the shorter the stature and the more slender, the less chance you have of getting cancer, breast cancer, at least. What about other cancers? Does that apply to other cancers, also?

Dr. CAMPBELL. Well, I speak again from our preliminary data. We need to analyze this more carefully, but one of the most interesting results we have so far seen in the China study is that the faster people grow, the larger they become, the greater is the risk for the kind of diseases we experience in the West. In other words, we have a strong correlation between ultimate body size and overall cancer deaths.

So I think what we may be considering here is a fairly fundamental question that I think Dr. Willett referred to, and that is this question of if whether or not the optimum rate of growth is the fastest rate of growth. I suspect it is not.

Chairman GLENN. If just the size of the body, the body weight is a factor, and I am just thinking afield here, but does this call into question some of our animal studies then as to whether mice that weigh a few ounces have differences when compared to an elephant, say, that you would give a comparable dose to, or something like that? Is that too far afield for us to even thing about?

But if you just have a difference here in incidence of cancer on the height and body weight, then is there something we should question in other animal studies, for instance?

Dr. CAMPBELL. I am not so sure we need to really go back and question so seriously the previous animal studies that have been undertaken because most investigators have been aware of that and they have corrected, of course, the intakes and exposures for the unit body weight size, if you will. So I think one can compare species of different sizes.

Chairman GLENN. You do in dosage. You compare the animal body weight with the human body weight to get the comparable dosages of whatever it is you are testing. But this would indicate that just the fact that you are bigger, taller and fatter means you are more susceptible.

Dr. CAMPBELL. And there is some considerable evidence to suggest that is true and that is in fact what we are seeing in the China study, too. The more rapidly one grows, the sooner one reaches sexual maturation, for example, the greater becomes the risk of some of the Western-type diseases.

Chairman GLENN. You suggest in your testimony something else. You suggest we have a complete evaluation of the whole diet and that, I presume, tests on this would be done over greater numbers of people.

How would we do this? How would we organize it? Who should do it? Should it be Government? Should it be private? Should it be private but Government funded? What would you suggest? And I would appreciate all of your comments on this, if you agree with Dr. Campbell that we should do such a study.

Dr. CAMPBELL. Of course, as I indicated in my testimony, I have become rather enthusiastic that when we look at information of this kind that we get away from focusing on detailed information, detailed products, detailed diseases, detailed mechanisms and take a broad look at the whole picture.

And of course, that is what we have attempted to do in China. We have mortality figures, for example, now not only on 16 different kinds of cancers but also on a number of non-cancer causes of death as well. And still in the next couple of years we hope to have even more detailed data on the kinds of things that people die of in China.

So I feel really quite strongly that taking this broad picture, this broad view of things would allow us not to make the mistakes, in fact, that I think we have made in past recommendations and in past policy decisions, if you will.

Chairman GLENN. Is anybody really doing worldwide studies on this? We have hundreds of different dietary patterns with different groups all over the world, and it seems to me with the computer capacity we have now, if somebody really organized to go into this, we do not need to go out and set up specific experiments; we have it already done by history for us. People with all sorts of dietary differences that live in isolated mountain valleys, or national dietary differences of borscht versus beef or whatever we want to set up, fish in Japan or whatever.

It seems to me we already have these dietary patterns. Couldn't there be a tremendous study done if we just organized the data we already have available to us and correlated that?

Dr. CAMPBELL. I think that is entirely possible, if we assume that the people we are studying are reasonably stable in terms of their residence patterns and in terms, also, of being stable in the kinds of foods that they consume, and that is a very important distinction.

We have to be studying people in this regard who generally live in the same place most of their lifetimes and, of course, have the same kind of environments and the same kind of dietary practices for their lifetimes.

Those are the kind of people, of course, we could study. We cannot really study in this way in particular people who change their dietary habits over a lifetime perhaps, or move about or get food from other places.

Chairman GLENN. Is that an area we should be pushing or looking at, Dr. Willett?

Dr. WILLETT. Well, I think in general it is. However, these studies just compare different geographical units with other geographical units and these different units differ in diet and also in disease. Actually, there have been a lot of such studies done already and there have been important clues. But they always leave grave concerns about the fact that other non-dietary variables differ substantially between these populations and might explain any differences in diseases that are observed.

Therefore, it is really in general considered to be probably the weakest kind of epidemiology except for very special situations like the China study that Dr. Campbell has been conducting where there are just very unique historical and geographical characteristics in China that make a study within China special and unusually good.

But I think it is fair to say that the general consensus among epidemiologists would be that while these geographic studies are informative, stronger evidence will be produced by large studies within countries that look at dietary factors in relation to disease. The Framingham Heart Study that began 30 or so years ago, was this type of investigation; 5,000 people in the Framingham community were enrolled, detailed measurements of blood cholesterol and blood pressure were made, and then the participants were followed over time.

The Framingham Study was not a large enough study to examine cancer in much detail. There are now several, really half a dozen ongoing studies, looking at detailed individual dietary intakes in relation to cancer. And as Dr. Campbell says, these should provide as comprehensive a picture of their diet as is possible. After measuring diets, then these populations are followed over time.

For example, in our study of nurses, we have such data from about 90,000 women and we have a parallel study in men, primarily dentists and veterinarians, that includes about 50,000 persons. These will produce many answers, but not all answers. And I think it would be helpful to conduct studies like these in other countries to get a broader spread of the kinds of diet people eat.

Some of these are ongoing, but I think they could be expanded; 50,000 men actually is not all that many when you want to look at questions in detail and examine complicated interactions.

Dr. GREENWALD. I want to alert you to one issue about this discussion. When we talk about stature, it is important to remember that there are a lot of things that are linked and therefore hard to tease apart. For example, the percent calories from fat in the diet, the grams of fat in the diet, the amount of calorie intake, stature, obesity, overweight—these things are tightly linked. Some of the debate on breast cancer, for example, is calories versus fat, when in fact they are closely associated. They both may be very important.

We do have some problems in teasing those apart in any type of study; certainly in the international data. On the other hand, there are huge international differences in the frequency of cancer; five to six fold in breast cancer. You do not have that difference when you look at a more homogenous population like the United States, so there is a research advantage in the international studies.

When people move from one country to another, their risk of cancer changes; it changes to take on the risk of the place to which they move. This supports the thought that diet is an important factor in cancer causation.

We know when the Japanese moved to the United States, their breast cancer rates went up, colon cancer rates also went up from the low in Japan more toward the U.S. rates. In the Japanese Americans or their children, stomach cancer rates go down. We see that same phenomenon in every population that has been studied where there is a large migration.

Chairman GLENN. Just a couple more here and then we do have to move on, we are getting very, very late. But Dr. Willett, you mentioned the Seventh Day Adventists and the difference between vegetarian and meat eaters there, and no difference in breast cancer with the vegetarians; was that correct?

Dr. WILLETT. Yes. Actually, that was just an article that came out this past week and I did not get a chance to put it in my notes. It was quite an important study because the Seventh Day Adventists have a broad spectrum in degree of meat eating; from non-meat eating to regular meat eating, and the same with a number of food products.

They are also a very special population because for many of the people you know exactly when they came into the church and altered their diet. In general, people do not suddenly stop and start a different eating pattern; we slowly evolve. But in that instance, it was possible to look at when they came into the Adventist Church and changed their dietary patterns.

It was impressive that there was really no relation between breast cancer and any of the foods that they looked at, whether or not they ate animal products or did not eat animal products, and the effect of coming into the church at different times in life. None of these seemed to make any difference in relation to breast cancer risk.

Chairman GLENN. Dr. Campbell.

Dr. CAMPBELL. I would like to add a word of caution here. The use of the word "vegetarian," at least in the U.S. context, usually means people who are consuming actually more diary products, and in fact in such a manner that their total fat intake is not that reduced. In the Seventh Day Adventist cohort that has been studied at Loma Linda, for example, the fat intake is of the order of 32 percent of calories and I would argue that that is already very near the non-vegetarian. So to compare vegetarians, in the U.S. context, against non-vegetarians, does not offer us much opportunity to learn anything.

Chairman GLENN. That is a very good point.

Dr. Campbell, once again, how relevant do you think the data from China is going to be to the U.S. population? Do you have a direct correlation or is that something that is yet to be seen?

Dr. **Campbell.** I think it is going to be very relevant to the U.S. population, and I make that argument on the basis of comparing, for example, the cardiovascular disease risk in China across all countries as related to serum cholesterol levels. I am sure Dr. LaRosa knows these data better than I, but if one plots the risk of cardiovascular disease against serum cholesterol for population groups, it comes down to the level of about 180 milligrams per deciliter, of the data that we know about.

In China, we are in the neighborhood of 125, and it turns out that their rate of getting heart disease is accordingly very low on that spectrum. So my own impression is that although we cannot at this particular point in time separate out totally the genetic/cultural differences, we hope to be able to do that.

Chairman **Glenn.** What is the overall life expectancy in China now compared to our 74 or whatever it is here now?

Dr. **Campbell.** The latest figures I have is it is 69 years. Women are higher, men are slightly lower. It is quite impressive.

Chairman **Glenn.** Just one other comment and then we will get on to our next panel here.

Dr. LaRosa, you mentioned the alcohol and I am interested in that one. We are going to have hearings later on this year on the alcohol problem and alcoholism and so on. We tend, these days, to concentrate all on the hard drugs and that is all of our problem, and we have big national programs, the President on TV, and Ms. Reagan on TV, and just say no to drugs and so on. And I certainly support all of those efforts.

At the same time, if we look at the overall devastation on American homes and individuals and the problems caused, we still come up with estimates like 80 or 85 percent of our problem is from the legal drug of alcohol. And we are going to be addressing some of that.

We are beginning to see more writing in the public press, too, and in magazine articles over just the last 4 or 5 months addressing some of the alcohol problem. I know that was not the subject of our hearing this morning, but you brought up how surprising it was that 5 percent of our caloric intake comes from alcohol, and I am surprised at that, too. I am very surprised at that.

But, we are going to be looking into the alcoholism thing a little bit later on this year and having some hearings on that because I think we cannot ignore the 85 percent of the problem from drugs that is from the legal drug of alcohol; not the pushers coming across the border or wherever they come from.

Gentlemen, we obviously could go on by the hour here and I appreciate very, very much you patience with me this morning. There may be questions we want to submit. I have page after page after page of questions here I have not even gotten to yet this morning.

You are excellent witnesses and we appreciate your cooperation. We may have some of those submitted to you. I hope you could reply and we would have those included in the record. And the other members of the Committee may want to address some questions to you also.

Thank you very much and we will get on to our next panel.

On our next and final panel are Dr. Myron Winick, Columbia University, Institute of Human Nutrition, College of Physicians and Surgeons, New York, New York, specializing in children's nutrition and Dr. Irwin H. Rosenberg, Director of the U.S. Department of Agriculture Human Nutrition Research Center on Aging, Tufts University of Boston, Massachusetts, discussing nutrition and the elderly.

Gentlemen, we certainly welcome you this morning. Dr. Winick will discuss the contribution of nutritional factors in normal growth and development during childhood, as well as pediatric antecedents to chronic disease processes. And Dr. Rosenberg will tell us how lifetime dietary patterns can help ensure a healthy old age, both by preventing certain diseases and retarding the decline of organ systems.

Dr. Winick, if you will lead off for us, we would appreciate it. You two have been very patient. I apologize to you that this has gone on so long this morning, but I am sure even you being professionals in the field were much interested in what was being said here this morning also. I do not know that you learned anything, but I know I certainly have.

I appreciate your patience in sticking with us this morning. Thank you.

Dr. Winick?

TESTIMONY OF MYRON WINICK, M.D., INSTITUTE OF HUMAN NUTRITION, COLLEGE OF PHYSICIANS AND SURGEONS, COLUMBIA UNIVERSITY, NEW YORK, NY [1]

Dr. **Winick**. My testimony today concerns nutritional problems prevalent in the United States that occur during early life and can affect later development and subsequent risk for disease.

Dr. McGinnis mentioned earlier that I chaired a Committee of the National Academy of Sciences on Nutrition Education in Medical School. I am not going to comment on that but I will be glad to answer any questions you have.

Let me begin with diet and pregnancy. For every 1,000 children born in the United States, 10.4 will die before their first birthday; most before they reach one month of age. In 15 other countries, infant mortality is lower than in the United States. Our relatively high infant mortality is related to the heterogeneity of our population. In 1984 the infant mortality among blacks was 18.4 per 1,000 live births, which approaches the rate in many developing countries.

Studies have shown that the high infant mortality among blacks is due to their lower socioeconomic state. Simply put, poor people are twice as likely to give birth to an infant who will not survive as their more affluent countrymen.

In the United States, the principal cause of infant deaths is low birth weight. As birth weight declines, infant mortality increases.

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[1] See p. 228 for Dr. Winick's prepared statement.

Not only are these small infants more likely to die, they are also more likely to show developmental defects and other serious health problems if they survive.

There are, of course, many causes of low birth weight among the poorest segments of our population. However, one of the most important causes is poor maternal nutrition. There is abundant evidence that undernutrition, both before and during pregnancy, will result in poor fetal growth and low birth weight. Hence, one way to lower the incidence of low birth weight among our poorer populations is to ensure that mothers are properly nourished throughout their reproductive years.

Not only could we save lives and reduce disability, but we could save an enormous amount of money and resources. The initial hospital cost for caring for low birth weight infants, added to the cost of caring for the increased amount of disability, has been estimated to be $15,000 per low birth weigh infant in 1984.

Studies conducted throughout the world, including some in the United States and Canada, have demonstrated that when poor women were supplemented with enough food to increase their caloric intake sufficiently to allow them to gain adequate weight during pregnancy, the birth weight of the infants increased substantially.

In addition to calories, the requirement for iron, zinc, calcium and folic acid increases. In the case of iron, the requirement increases more than 300 percent during pregnancy. When this is coupled with the fact that iron deficiency is present in more than 30 percent of women of child bearing age, and that the incidence is substantially higher among poor women, most physicians will routinely supplement all pregnant women with iron.

To a lesser extent, the same is true for folic acid, one of the B-complex vitamins. Clearly, if we wish to lower the incidence of low birth weight babies and lower our infant mortality rate, we must carefully monitor pregnant women, identify those at high risk, and get them into prenatal programs designed to lower that risk. Good nutrition will be an integral part of any such program.

Proper nutrition should begin before pregnancy. By the time pregnancy is diagnosed, the period of embryogenesis is almost over. It is during this period that most severe birth defects develop, thus anything associated with birth defects would probably exert its influence before a mother even knows she is pregnant. Excess alcohol intake, certain drugs and certain nutritional deficiencies fall into this category.

Recent studies have indicated that certain types of birth defects may be associated with both zinc and folic acid deficiency. There is some evidence that early intervention has been very successful in a particular population—women who have already given birth to infants with a severe complex of birth defects known as neural tube defects. The probability of giving birth to a second child with such a defect is very high.

Supplementing such a population with either folic acid alone, or a multivitamin preparation containing folic acid 28 days before conception and continuing throughout pregnancy has resulted in a dramatic lowering of the expected number of neural tube defects. Undoubtedly, other populations exist in which nutritional intervention before pregnancy might lower the incidence of birth defects and early abortion. A system that can monitor the nutritional status of women during the child bearing years would allow such data to be coupled with data relating to the outcome of pregnancy, thereby making it much easier to uncover these populations.

The importance of nutrition during the pre-pregnancy period is particularly relevant when we consider adolescent pregnancy. In addition to the amount she must gain during pregnancy, the adolescent must gain weight to sustain her own growth. If she is significantly underweight before becoming pregnant, she will have to gain a very large amount of weight during pregnancy to have the best chance of delivering a normal size infant.

Add to this the fact that many adolescents will deliberately try not to gain much weight during pregnancy, and it becomes obvious that the adolescent who is pregnant is at very high risk for delivering a low birth weight baby.

Infant feeding. Well, the best food for the human infant is human milk. It provides appropriate amounts of energy. It provides factors that protect the infant from infection and help the infant's organ systems mature properly. It contains enzymes which help the infant digest some of the nutrients it provides, and it rarely causes allergic responses.

Human milk from an adequately nourished mother contains all of the essential vitamins and minerals with the exception of Vitamin D. But perhaps more important than the nutritional advantages of human milk are its anti-infective properties. First, there are specific antibodies which are present in colostrum, the milk secreted during the first few days, and to a lesser extent in the milk itself.

Second, there are cells which are part of the mother's already mature immune system which are passed through her milk to her infant throughout the period of breast feeding.

Third, there are specific factors which inhibit the growth of certain bacteria and stimulate the growth of others. As a result, the breast-fed infant is much less prone to infections of the gastrointestinal tract such as diarrhea, and of the respiratory tract, such as bronchitis or pneumonia, than the formula-fed infant.

It is very important to the health of our youngest citizens for breast feeding practices to be monitored and for breast feeding to be encouraged on a national scale among all ethnic groups.

Infant formulas, while not as good as breast milk for the very young infant, have been shown to sustain normal growth and development if they are properly formulated and appropriately used. Since many women still do not breast feed, and since most women have given up breast feeding before 6 months, it is imperative that infant formulas be as complete as possible.

With few exceptions, the quality of the formula itself is very good. Problems, however, have arisen and continue to arise because of poor preparation. In developing countries, the water that is added may be contaminated. Refrigeration is lacking and over-dilution is common to save money. Some of these problems are also present among the poorer, uneducated segments of our own population.

Severe protein calorie malnutrition during the first 6 months of life is still the number 1 cause of infant mortality and morbidity in the world. In the United States, while it is not as frequent as in the developing world, it still exists. How frequently does this totally preventable disease occur in the United States? We do not know. There is no adequate mechanism in place to monitor the nutritional status of very young infants on a national scale.

Severe protein calorie malnutrition coupled with the conditions of poverty and deprivation which often accompany it results often in death and often in brain damage to the survivors. Evidence gathered during the past 25 years from laboratory studies and studies in a variety of populations throughout the world bears this out.

Children who have died from severe early protein calorie malnutrition have smaller brains with fewer cells, fewer nerve connections and less-well insulated nerve fibers. Animal experiments have shown that these changes are permanent, persisting into adult life. Those who survive will show retarded development with a loss of motor and sensory skills and a reduced intelligence quotient. Their performance in school is substandard and their ability to perform meaningful jobs is reduced.

The Women, Infants and Children program was designed to help solve this problem. There is every indication that when operating efficiently it is working. However, the outcome of infants who have been in the program has not been monitored at a national level.

The school age child. Iron deficiency is the most prevalent nutritional disease among preschool and school age children. Many studies have shown that children with iron deficiency, particularly those with iron deficiency anemia, have short attention spans and do poorly in school. Treatment with iron will produce dramatic improvement and consumption of a diet rich in iron will sustain that improvement.

Although it is well known that iron deficiency is more common among children from poorer segments of our population, the exact number of such children nationally is not precisely known. No mechanism exists for correcting the deficiency if it is uncovered during large-scale surveys.

Adolescence. Growth during adolescence is faster than at any other time except before the first year of life. Therefore, all nutrient requirements increase. Iron deficiency is again extremely prevalent during this period, as is zinc deficiency and deficiency of folic acid. In addition, the adolescent, particularly the adolescent girl, is prone to obesity.

Finally, let me talk for a moment about the pediatric antecedents of adult disease. Although it is clear that a low-fat, low-cholesterol diet is desirable in adults, the age at which such a diet should be started is presently controversial. A consensus conference held by the National Heart, Lung and Blood Institute concluded that at the age of 2 years it is desirable to begin a diet consisting of less than 30 percent of calories as fat, divided equally between saturated, monounsaturated and polyunsaturated fat, and less than 300 milligrams per day of cholesterol.

These conclusions were reached in part on the basis of evidence that American soldiers, for example, killed during the Korean or

Vietnam wars, showed an alarmingly large number of cases of fatty streaks within their coronary arteries.

Shortly after the publication of this report, as you have heard, the Committee on Nutrition of the American Academy of Pediatrics issued a report of its own concluding that the data did not justify the recommendation. They felt that there were no data demonstrating that a low fat, low cholesterol diet would adequately support normal growth and development in a child.

For example, myelination, the deposition of fat-containing material around nerve sheafs, is not complete until about age 5. Of particular concern is that some mothers will go well beyond the recommendation and limit fat and cholesterol intake to very low levels. It should be emphasized that there is no disagreement about whether dietary fat and cholesterol should be limited. It is only the time when limitation should begin that is in dispute. If such changes are instituted at any time during childhood, it is extremely important that their effects be carefully monitored.

Hypertension. Hypertension is present in 30 to 40 percent of adult Americans. Although it is much rarer among children, there is a growing body of evidence that some of its antecedents may begin in childhood. Currently it is believed that some people are prone to hypertension if they consume a diet that is high in sodium. American children, particularly older children and adolescents, consume a very high sodium diet.

A number of studies have demonstrated that a preference for salt, the main source of sodium, is learned. Thus the child exposed to a high sodium diet will learn to prefer foods that have a salty taste and hence prefer such foods as an adult. These data would suggest that some children consuming a high sodium diet may be increasing their risk for adult hypertension.

Obesity. The problem of obesity also may begin in childhood. The question is, at what age is dietary intervention appropriate to prevent obesity? The data continue to accumulate and suggest that if we wish to reduce the risk of adult obesity, we must seek to prevent childhood obesity before age 3. This may be more difficult than previously thought. Recent evidence suggests that obesity in part may be genetically controlled and that obese children and adults may be metabolically different than lean individuals.

Finally, osteoporosis. The greater a woman's bone mass, the lower her risk for osteoporosis. Bone mass reaches its maximum by the end of adolescence with very little increase thereafter, thus any intervention designed to increase bone mass must occur during the growing years. Throughout infancy, childhood and adolescence the body is in positive calcium balance. More calcium is retained than is lost.

It is during this period of life, therefore, that adequate calcium intake will ensure maximum calcium deposition into bone. It is during these years that particular attention must be paid to dietary calcium intake. Consuming a diet adequate in calcium during the growing years may be more important in lowering a woman's risk for osteoporosis than taking calcium pills later on.

Thank you.

Chairman GLENN. Dr. Winick, thank you very much. You have given a lot of material for thought there and enough for a thousand questions, I am afraid. But we will go on first with Dr. Rosenberg, who is Director of the United States Department of Agriculture's Human Nutrition Research Center on Aging at Tufts University and a Professor of Nutrition and Medicine at Tufts.

Dr. Rosenberg is a Harvard Medical School Graduate, has served as Chairman of the Food and Nutrition Board of the National Research Council and as President of the American Society for Clinical Nutrition.

Dr. Rosenberg, we welcome you this morning.

TESTIMONY OF IRWIN H. ROSENBERG, M.D., DIRECTOR, U.S. DEPARTMENT OF AGRICULTURE, HUMAN NUTRITION RESEARCH CENTER ON AGING, TUFTS UNIVERSITY, BOSTON, MA [1]

Dr. **Rosenberg**. Thank you, Senator Glenn.

In the two decades since the White House Conference on Nutrition and Health in 1969 and the one on Aging in 1971 there has been a gratifying increase in public concern with the importance of diet and nutrition and their relationships with health and disease.

I might say that that dramatic increase in public concern has not been matched, as was indicated earlier in the morning, by the same increase in attention in the medical profession and in medical education, and perhaps that is something that we should discuss further.

No where is the promise that improved diet and nutrition may contribute to greater health and vitality more compelling than in the case of the growing population of elderly in this country. You are well aware of the population trends. At the beginning of this century 1 in 25 Americans was over 65 years of age. This year that figure is 1 in 9 and in the year 2050 statisticians predict that 1 in every 5 Americans will be over the age of 65.

Average life expectancy at birth is now 75 years, dramatically increased from 47 years of expectancy at the beginning of this century. It could well be argued that one of the greatest challenges to our social and economic planning is this remarkable change, the graying of our population.

While average life expectancy continues to increase as a substantial credit to our progress in health care and nutrition, we cannot lose sight of the fact that 80 percent of these elderly have at least one chronic condition of which osteoporosis, arthritis, hypertension, hearing and visual impairments and cardiac conditions are among the most prevalent.

On the average, individuals over the age of 75 years of age make eight visits to their doctors every year, and in 1985 approximately 5 million elderly in the United States required long term care. That latter number is rising.

Thus, one of the great challenges to health science is to examine what it is that we have done successfully to contribute to the steady improvement in life expectancy, to examine the diets and nutritional status of adult Americans as they change with age and as they reach the extremities of life.

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[1] See p. 253 for Dr. Rosenberg's prepared statement.

We need a broader scientific foundation for making recommendations about the diet and nutritional requirements of elderly Americans and determine what may be the optimal diets and nutritional intakes which will allow the greatest number of our elderly Americans to remain vigorous and self-sufficient in their older years.

In the few minutes available to me, I would like to briefly address several issues. First, what do we know about, and what more needs to be known about, the nutritional status of our elderly? How does aging per se influence nutritional status? How much do we know about the consequences of poor nutrition on the health and vitality of our aging population? Can we expect diet to influence the decline of organ function which so commonly accompanies aging? And finally, what more do we need to know about nutritional requirements of the elderly and recommendations for healthful diets which will maintain maximum vitality?

There are some physiologic functions with aging that can influence food intake and the utilization of nutrients. Cross-sectional studies like those of the Baltimore Longitudinal Study on Aging under the auspices of the National Institute of Aging, have shown that organ function tends to decline with age. This includes cardiorespiratory function, muscular/skeletal function, mental function and memory.

Similarly, there is a decline in the sensitivity to taste and smell which can influence at the extremities of age the appreciation of food and thus of dietary intake. In addition, there are changes in the function of the digestive tract which can influence nutrient absorption and utilization.

Among these changes are a diminution in the production of stomach acid in one-third of the individuals over the age of 65 which may result in some change in the efficiency of absorption of certain nutrients such as iron, folic acid and possibly calcium.

A number of status surveys of the elderly population have been performed in the past decade in this country and abroad. The outcome of such surveys is strongly influenced, not unexpectedly, by the location and selection of the survey sample. For example, free-living elders tend to have much more normal nutritional status than do those who are institutionalized. The urban poor and those from minorities show more problems than do samples from caucasian and middle class populations.

In the survey recently completed by the USDA Human Nutrition Research Center on Aging at Tufts University, we showed a declining intake of calories with increasing age that runs parallel to a diminishing body muscle mass and also decreasing physical activity with age. As a result of the decreased total food and calorie intake, there is also a tendency to diminish intake of other elements of the diet, including vitamins and minerals.

For those elders with the smaller calorie intakes, particularly those under 1,500 calories, it is increasingly difficult to select diets which are fully adequate in all the essential nutrients. Thus, several studies such as the one in Boston have demonstrated dietary intakes of Vitamin D, Vitamin B6, folic acid, calcium and zinc, which are questionable for 30 to 70 percent of those studied.

Clinical and biochemical studies demonstrate vitamin and mineral deficiencies in only small numbers of their free-living elderly population and in a larger percentage of bedridden and institutionalized elders.

As our population ages, it is increasingly important that we answer further questions about the best methods to carry out nutritional screening and assessment of the elderly, especially those who reside in increasing numbers in nursing homes and long term care facilities. Any program of national nutritional monitoring must take into account not only the adequate sampling of the elderly population, but also the monitoring of the nutritional status of the institutionalized and bedridden elderly.

In addition, it is important that surveillance include those who are living alone who more often present special problems socioeconomically and nutritionally.

Now, in the face of evidence from nutrition surveys that dietary intake declines with increasing age, what can be said about the relationship between dietary adequacy and health and vitality of the elderly population? Medical research has shown us that certain dietary patterns influence the onset or severity of degenerative diseases, as we have heard earlier this morning.

A combination of such conditions often results in a chronically ill, dependent elderly person as opposed to a vigorous and self-sufficient one. We know that proper diet throughout life, and in our adult years especially, can influence the onset and expression of adult diabetes. We know that dietary patterns can influence the expression of the tendencies for coronary arteriovascular disease and hypertension. There is evidence that diet is one of the factors influencing the onset of osteoporosis.

At our Center, we have been interested in nutrition and the maintenance of healthy organ function with age and some hopeful observations have already been made at this Federally funded Center which is only 5 years old this year.

Scientists at the Center have observed that the loss in the bone density which regularly accompanies age beyond the menopause can be influenced by dietary calcium intake. The muscle mass and strength which is reported to decline with age in cross-sectional studies of the elderly can be maintained in individuals with a program of regular exercise.

The efficiency of rebuilding muscle after vigorous exercise may be diminished in older persons, but it may well be possible to meet the increased requirements for muscle rebuilding by improved dietary intake, especially of protein in the elderly.

The genetic tendencies for abnormal blood cholesterol patterns and increased risk of heart disease and other vascular diseases may be modified by changes in dietary fat intake and even by intake of certain vitamins. Especially exciting is recent work indicating that we can use biochemical markers to identify those individuals who utilize dietary fats in different ways and therefore identify those who particularly need to modify their diets.

We are going to increasingly need to focus attention on understanding genetic variability so that we can understand the variable responses to dietary modification.

Changes in the opacity of the lens of the eye, or cataract, results in declining vision or blindness in 50 million elders around the world. In this country we perform 700,000 cataract operations annually. Our scientists at the Center have observed that the process of cataract formation may be able to be modified by dietary intake of certain antioxidant substances such as carotenes and Vitamin C. A delay in cataract onset by 10 years would result in as much as $1 billion saving in annual health costs.

While memory loss with aging involves many factors, deficiencies of certain nutrients are known to result in reversible impairment of mental function. For example, deficiency of Vitamin B6, a problem nutrient in our surveys of the elderly, results in some loss of cognitive function.

As we examine the dietary intakes of older Americans we recognize that we need to know a great deal more about what is an optimal intake and where dietary patterns should be changed so as to best maintain vitality in the older years. We need better data on the changing energy and protein requirements of aging Americans so as to be able to meet those needs most appropriately.

We need to modify the recommended dietary allowances so that special needs of the elderly are considered, rather than using figures which are extrapolated from studies in younger adults. That will require more direct studies in older individuals.

We need to better define the health goals which underlie our dietary recommendations. Ideally, we need to be able to describe the dietary requirement for expected degrees of physical and intellectual vitality.

In closing, it would be unwise and almost certainly inaccurate to expect that the fountain of youth and vitality will be found simply in dietary recommendations. Genetic, environmental and other physiologic factors will influence changes in health and vitality with aging.

However, we have shown in the past 2 decades that we can influence the morbidity and mortality for major degenerative diseases such as heart disease by a combination of changes in habits of diet, smoking and health care. This should lead us to extend our efforts in the direction of timely information on nutritional status in relation to nutritional requirements in the elderly.

We need more research on the way in which meeting these requirements can influence the expression of the aging process. The return on these investments in monitoring and research could be enormous.

Thank you.

Chairman **Glenn**. Thank you, both of you, very much. I was interested in those comments on the vitamins. I was going to say I am glad you brought those up because I could not remember what the vitamins were I was supposed to take. Vitamin B6 will alter that, I hope.

We do need studies in a lot of those areas. I agree with that. Dr. Rosenberg, you work for USDA even though you are at a university. How much support does the Department provide? What is your working relationship with USDA? And who determines your research priorities? Are they assigned to you or are you left free to run your own research?

Dr. **Rosenberg**. I am a faculty member of Tufts University and the Human Nutrition Research Center on Aging is run by the Tufts University on a contract with the USDA. It is one of two of the five human nutrition research centers that are organized that way. The one at Baylor University is oriented to studies of maternal and child nutrition.

We have a mission, which is to look at the nutritional requirements of the elderly and nutritional interactions with the aging process. And within that mission we scientists at the Center have a good deal of latitude in determining our research agenda.

There is a program office within the U.S. Department of Agriculture with which we work very closely in looking at our research accomplishments and agenda, and I think that this is a new concept which I would say is working very well.

I think it is an excellent example, in my view, of combined inputs from university and the Federal sector toward a research goal.

Chairman GLENN. What about NIA? Do you do any work with the National Institute on Aging? Do they fund any of your projects? And is that a cooperative effort through USDA? How does that work?

Dr. ROSENBERG. Our core funding at the Center comes from USDA, but we have an increasing number of grants that are funded from National Institutes of Health, from foundations and other sources, and we have an increasingly strong interaction with the National Institute of Aging and we have already engaged in a number of collaborative ventures and have plans for a good deal more.

I think in the future our Center will increasingly be involved in a collaborative way with the National Institute on Aging.

Chairman GLENN. Have you done any work internationally? Studies in China, the Soviet Union, and so on? Do you remember these things on TV—not to interject a light note here but I will anyway—remember the ones where yogurt was being advertised and the 91 year old man talks about how healthy he is and he always eats yogurt, "and my mother does, too." Do you remember that? It showed a picture of her there, too.

It was interesting and there are some areas in the Soviet Union, for instance, where they have an inordinate number of people that live beyond 100 years of age, down in the Ukraine somewhere. I forget where it is. And they do not know why, either. They have done a lot of studies in that area and the only thing anyone can ever come up with is that the people there tend to live a very regular, ordered life in most of those communities.

They get up within 5 or 10 minutes of each other at 6 o'clock in the morning and the lunch happens at a certain time and when everything has happened, they go to bed at the same time. It is a very ordered life, and that is about the only thing they have ever come up with, according to the Soviet—I forget his name now—who is in charge of their geriatric studies who attended Dr. Butler's meetings some years ago.

Do you do work back and forth with other nations looking into things like that and then doing nutrition studies with them?

Dr. ROSENBERG. We are beginning to do somewhat more of that. As I mentioned, the Center is quite young. We are having our 5th anniversary this year and I think the original efforts of the Center were to establish a broad program focused on organ function in the elderly and the nutritional impact on those developments.

I would say, though, that there are some very important opportunities in international research and we do have collaborative studies in other countries where there are some places where there is a much better opportunity to look at a nutrition and aging interaction than we could find even in our own population. And so we have had some studies in Central America. We have had some studies in Asia. We are increasing our studies in China and with Japan, and so I agree that those opportunities will be important ones.

Chairman **Glenn**. Dr. Winick, from your perspective, is the Federal Government's support for research on the dietary factors in child health and development and so on, has that been increasing or decreasing over the last 20 years, 10 years, 5 years——

Dr. **Winick**. Well, I think in real dollars there has been some decrease certainly in the last 10 years. But having said that, I think there are certain concepts which are beginning to involve children and the developmental years that did not involve the developmental years before. So that what we are seeing now is more focus on the things that happen in childhood which may very well determine whether or not you get atherosclerosis or hypertension or any other diseases.

Chairman **Glenn**. Yes. That is much of the main thrust of your comments, and I thought that was very interesting. I do not think we have paid nearly enough attention to that. I did not relate to that when my own kids were growing up. I know that. Maybe we have learned a lot in the intervening years.

But I do not think enough attention has been paid to that, that if we take a lot more pains with nutrition and with problems like this early in life, there probably, I would guess, is a multiple of savings out at the far end in decreased problems at the other end of life. Is that a fair statement?

Dr. **Winick**. I think it is, and that is becoming more and more obvious now, and that if you lose the opportunity during childhood, you may not get that opportunity again.

Dr. **Rosenberg**. I think the same thing can be said about the health of the elderly, that clearly what we need to understand is how nutritional factors earlier in life throughout the maturation process in adult years influence the health status of older Americans. So it is a long-range process.

Chairman **Glenn**. Dr. Campbell a while ago talked about the complete evaluation of the whole diet. He did not really get into details of who would do the cost and who would do whatever on that, and who would run something like that.

Do you think that is a good idea? Do we need something like that that would give a much broader picture of the dietary concerns right across the whole life span? If so, who would do that? Should it be a Government role? Should that be contracted out? Either one of you.

Dr. **Winick**. Well, I think from the perspective of children and the growing years, that would be quite important for a number of reasons. First of all, the present surveys that are going on are not focused on children and we need some more focus on the developing years.

Second, a change occurs very rapidly during the childhood years so that the kinds of studies that are necessary that would be best done are those which are able to follow a cohort of children through their growing period. So I think in the case of children, and in the case of pregnant women, for example, that a system which is able to relate their overall dietary patterns to either the outcome of pregnancy or the outcomes involved in growth and development would be very important.

Dr. ROSENBERG. The strategy of longitudinal and followup studies is a very, very challenging one. As I indicated earlier, the National Institute of Aging has the Baltimore Longitudinal Study where people are followed year after year and various variables are looked at in terms of health outcomes.

We would like to increase the nutrition component of a number of such studies of aging cohorts and we are making efforts to do that, including the Framingham Heart Study, which actually has not had as strong a nutrition component in the past as it might have had and that is now being corrected in future activities.

But although I am not an epidemiologist, I do note that whenever one mounts a comprehensive longitudinal study of that kind, it is a huge undertaking. It is very costly. And one only gets answers to the questions that are carefully thought of in advance. Therefore, one has to make some decisions about what the goals of such study are, and so one has to strike somehow a balance between specificity and general observations in any such study design.

Chairman GLENN. Just so we make sure the record is correct, in your testimony you mentioned the Baltimore Center for Aging, and I presumed that you meant the NIA's Baltimore Longitudinal Study on Aging; is that correct?

Dr. ROSENBERG. Yes. My written comments were—I have changed them here. It is the Baltimore Longitudinal Study.

Chairman GLENN. Okay. I just wanted to make sure that was correct.

Dr. Winick, we have guidelines all over the place, and books. You cannot go in a bookstore without all sorts of advice and books, paperback, hardback, you name it, on dietary guidelines for kids, teens, you name it, and what is necessary for pregnant mothers, for lactating women, for growing children, for adolescents.

Who should make these recommendations? How specific do you think they should be? How should the information be communicated? And what is the Government's role in all of this thing? Who separates out all of this fact from fiction?

Dr. WINICK. Well, unlike much of the rest of the population, during the first year of life and during pregnancy there is some medical or health professional control. Most pregnant women are under some kind of professional guidance and most infants are cared for during the first year of life under professional control.

So to me, it is extremely important for that age group for the professionals to be educated in terms of proper diet and proper type of advice to be able to give to them.

Chairman GLENN. We do not even require that in medical school. You went to medical school. Did you have to take a course in nutrition?

Dr. WINICK. I did not have to take a single course in nutrition when I went to medical school.

Chairman GLENN. Did you?

Dr. WINICK. Did I take a course in nutrition?

Chairman GLENN. Yes.

Dr. WINICK. There were none offered when I was in medical school.

Chairman GLENN. None even offered?

Dr. WINICK. No.

Chairman GLENN. Dr. Rosenberg, were you in the same situation?

Dr. ROSENBERG. I went to Harvard Medical School, which had a very strong nutrition program in the School of Public Health adjacent to the Harvard Medical School and there was some opportunity therefore to take some nutrition courses. But it was not an integral part of the curriculum at the time.

Chairman GLENN. You were not required to take a course? When you went through medical school you were not absolutely required to take a course in nutrition of any kind?

Dr. ROSENBERG. Not at that time.

Chairman GLENN. Do they now?

Dr. ROSENBERG. I do not know about Harvard, but I can tell you that at Tufts a nutrition course is required, and the amount of nutrition in the curriculum is increasing. But it is a battle. It is a battle in every medical school because of the—and Dr. Winick and his Committee addressed this—because in part there are many other demands on the limited amount of time and brain cells that are involved in the medical education.

Dr. WINICK. From the standpoint of numbers, Senator, two years ago when the study was completed, 20 percent of medical schools in the United States offered a required course in nutrition. I have had the occasion to follow this up during the past year and the number has, at most, increased to 30 percent of medical schools. So still, in 70 percent of medical schools there is no required course in nutrition.

Now, there are a variety of reasons for this. Irv brought up some of them. I think though an important reason is mind set. And that is, there is a curative mind set still in medical schools which is slowly changing. And nutrition, of course, plays its important role in the prevention of disease. And so as with many of the preventive aspects of medicine, they are slow to get into the curriculum, but we are working on it.

Chairman GLENN. To get back to my original question, though, is there a role Government should play? And I do not want you to just say yes, there is a role Government should play if you do not believe it just because you happen to be in the Senate hearing room here. Maybe you feel that the New England Journal of Medicine and all the rest of the publications that go out all over the country are adequate to start getting this information out.

But is there a vital role that Government should be playing? And should it be expanded? If so, how and what and who does it? Can you give any advice on that? And do we need legislation?

Dr. WINICK. Well, it seems to me from the standpoint of surveys, nutritional surveys in terms of knowing what is the nutritional status of our population, that would be a very important role for Government to play, and I cannot really see anybody else taking responsibility for collecting the kinds of national statistics that are necessary to know what the nutritional status of our population is.

Now, we have a mechanism at present which is a Government mechanism which is doing it. I think that needs to be expanded and looked at in a number of different ways.

For example, the HANES, which is the main study, does not specifically concern itself with pregnant women or with very young infants. They could be expanded, clearly, to do that if they were adequately funded and if their mission was made clear to do that.

So I think that there are areas where Government can be very effective in doing these kinds of surveys on a national scale and getting research going using the kinds of data that come out of these surveys.

On the other side of the coin, I think, clearly, that in terms of research there are certain things where the Government sets priorities and there are certain areas where you want the investigators coming from the academic communities to set the priorities in terms of where the research is.

There has been a balance of this in many areas and I think such a balance would be important in nutrition. So I would not see Government setting the research agenda, but I would like to see Government much more involved in helping to collect some of the data which are very, very important.

Chairman GLENN. Dr. Rosenberg?

Dr. ROSENBERG. Well, I certainly do think there is a clear role for the Government in establishing mechanisms for the dissemination of proper nutrition guidance as well as other health guidance to the public. I think that that goes hand in hand with the commitment of the Government to gather information and then making public policy out of that information.

The secret, in my view, is to make sure that the recommendations that are being made, whether they are being made by Government and even to try to influence the information marketplace to the extent that that can be done in a free society, are made on the basis of scientific information.

Chairman GLENN. Who screens that? Who does that?

Dr. ROSENBERG. Well, I think that is a very complicated question, Senator. I do not think that in our society we can allow the Government to make all of those decisions. There is going to be a dynamic that is—I think the example which was described here a moment ago is a very interesting one. You had the Government that sponsored a so-called consensus conference on diet and heart disease. That consensus conference involved people from Government, people from academia, people from industry and so forth. And in addition to that there was a sort of a rebuttal on aspects of that that came from the Academy of Pediatrics, which is a professional organization.

I think that the information about health, and especially diet and health, is going to come by a dynamic from academia, from industry, from the private sector, and from Government. Government, I think, has a clear and important part of play in that.

I happen to believe that the Government also has some responsibility to see to it that the public is not misinformed. I think that some of the things that have been appearing on box tops which have been making health claims for foods are very hard for the public to understand. And I would have, frankly, favored a bit more effort on the part of certain agencies to see to it that some of those messages were put in a form that the people can understand.

Chairman GLENN. Okay. Now you are sticking your toe in your water but not getting completely involved here, because that is exactly the problem that I am getting at, is who does that? Who says, you cannot put it on the box top in a free society? And if I say to General Mills, you cannot put it on the box top, I better have some test then back here to make sure I can back that up, or some study, or I cannot make it stick, and I should not, because I might have somebody over there in the Department some place, whether it is FDA or Ag or anybody else, who maybe does not have the whole picture and yet they are putting out something that stops a whole business with maybe many millions of dollars and thousands of jobs involved.

Who makes that decision? Should that be Government? Should we turn it over to some private group? Is FDA now emphasizing more the food part of FDA than just the DA part of it that we normally emphasize? Who does that?

Dr. ROSENBERG. I am not a political scientist. I was the Chairman of an FDA panel on vitamins and minerals in the 1970s to try to make some sense out of all the noise and information and misinformation that was going on and what could be appropriately said to the public, and we wrote a study that was never implemented by the FDA because there is so much attack on any kind of effort to discuss any regulations in this area.

I do not know the answer. My own feeling is that the Food and Drug Administration in fact does have some responsibilities for the healthfulness of the food and drugs that our people take and for the fair labeling, for the honest and fair information that goes along with those. The FTC, as I understand it, has some responsibility for the honesty of our advertising. At some level that responsibility has to be translated into a decision about what is appropriate and what is not appropriate.

I think that those decisions ought to be made not on political grounds only, although that is going to influence the process, but by heavy input of what kind of scientific messages are appropriate and can be delivered by those means. I think some kind of scientific messages can be delivered on box tops and others should not be delivered on box tops.

Dr. WINICK. It is a question in a sense of where is the burden of reasonable proof. On the one hand, one does not want to limit what can be said in advertising or box tops or what have you. But if a health claim is going to be made, then whoever makes the health claim should have reasonable proof that that health claim is appropriate to have been made, and I think that is where the FDA's judgment or some regulatory agency's judgment would come in.

I do not think the burden of proof should be the other way. I do not think that one should be able to make a health claim and then the public has to prove that it is wrong.

Chairman **Glenn**. The reason I was pressing a little bit in this direction—I did not mean to keep after it too long—but the main reason I was pushing was because I think the problem is going to get a lot more complicated than less and we have to be prepared to deal with it.

We are either going to get into it and do it or we are going to say, somebody else do it and monitor these things, or we are going to give it to an agency or we are going to give it to NIH or we are going to give it to somebody to monitor these things because, as Dr. LaRosa pointed out, we are getting more and more to food derivatives or specialized food or food that is supposed to do X for you, whatever it is, and we are getting more and more into these separated things instead of a whole food overall diet complex.

We tend to tailor in on these specialty areas and if you are not careful you can get something out there that if people eat too much of it, whatever it is, it is liable to wreck your health instead of help your health. And so someone has to monitor that.

Dr. **Winick**. If I could add something here, particularly these things are very relevant to pregnant women and to young infants where the effects of a mistake could be catastrophic.

Chairman **Glenn**. I just have one final question, and this is to Dr. Rosenberg. I was wondering when you were talking a little while ago, the problems with the aging population that we have, is its lack of nutrition and is it that the body changes so that it just does not absorb some of the things that it really needs? In other words, are there elements and chemicals that if I ate a ton of the food that has that in it, really my body just at a certain age normally would not absorb enough to keep me in a normal state of good health? Is that a factor?

Dr. **Rosenberg**. Well, I am a gastroenterologist and so I have had an opportunity to study in some detail the changes in the digestive tract that occur with aging. I mentioned earlier that the stomach changes in about 30 percent of elderly so that it stops making the normal amount of acid, and that can influence the absorption of a couple of nutrients, vitamins and minerals, which require some acid in the small intestine for absorption.

Having said that, let me say that the evidence that there is a significant decline in absorptive function with aging is very small and in fact the healthy elderly absorb nutrients just about as well as younger adults.

In fact, there are a couple of vitamins that they absorb even slightly better than younger adults, some of the fat-soluble vitamins are actually absorbed faster in the elderly. So I do not think that we can use, at least in a general way, declining absorptive function as an argument for increasing the requirements for the elderly.

We have to actually take each nutrient sort of and study each one in its own case, and we are finding in some of the studies that we are doing at our Center that there are certain nutrients that appear to be not as well utilized, not because of absorption but because of metabolism and other things, as in younger adults, and those may require some increase in their requirements in the diet of the elderly.

There are some that probably could afford to be taken in smaller amounts.

Chairman Glenn. The problem with talking to you people is every time you say something it raises 10 more questions that are good questions, and I do have to end this very shortly. It is almost 10 minutes of 1 here. But let me ask this, anyway.

You bring up stomach acids and they go down in the elderly, and yet here we have people on TV saying take Tums because the calcium you get out of Tums, which basically are to cut down excess stomach acid to begin with, but you take Tums now because it has calcium that fights osteoporosis, theoretically. And I could interpret what you are telling me as saying you should not take Tums if you are elderly because it is going to cut down stomach acid and leave you in some other problems than osteoporosis; is that correct?

Dr. Winick. Well, I will make it even more difficult, it may take us the afternoon, and that is that if you are lacking stomach acid, you absorb the kind of calcium which is in Tums even less well. So that there are some problems.

I think, clearly, people should not be taking Tums unless they need it for the acid, although Tums is, in general, a reasonably good source of calcium for those that need calcium supplements.

I think we need more information about the interaction of drugs and nutrients. For instance, in the elderly, the average elderly person over 70 years old is probably taking three or four or five medications and we need to know how those medications affect their dietary intake and their nutrient utilization. That is a whole other part of the research agenda and the health agenda.

Chairman Glenn. The whole thing is fascinating. We obviously could go on all afternoon, so we will end this now. Gentlemen, I appreciate your being very patient with us here and staying as long as you have. It has been intensely interesting this morning.

We may want to get back to you with some additional questions. If we do, we would appreciate your response so it can be included in the record.

The hearing will stand in adjournment subject to the call of the Chair.

[Whereupon, at 12:50 p.m., the Committee adjourned subject to the call of the Chair.]

NATIONAL NUTRITION MONITORING AND RELATED RESEARCH ACT OF 1987

TUESDAY, MARCH 22, 1988

U.S. SENATE,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
Washington, DC.

The Committee met, pursuant to notice, at 9:18 a.m., in room SD-342, Dirksen Senate Office Building, Hon. John Glenn, Chairman of the Committee, presiding.

Present: Senators Glenn, Roth, Bingaman, Heinz, Levin, and Sasser.

OPENING STATEMENT OF CHAIRMAN GLENN

Chairman GLENN. The hearing will be in order. Welcome to today's hearing on nutrition monitoring. This morning's discussion will focus on the merits of the National Nutrition Monitoring and Related Research Act of 1987; that is Senate Bill 1081. It was introduced by our colleague, Senator Jeff Bingaman, and was referred to this Committee.

As we consider the legislation before us today, we will explore with our witnesses their views on how the Federal role in nutrition monitoring research might be improved by the passage of this legislation.

On March 1st, the Governmental Affairs Committee held a hearing on the role of nutritional factors in health maintenance and disease prevention, and we heard from key researchers in the fields of cancer, heart disease, pediatrics, and gerontology about what we do and do not know about diet and disease relationships.

We learned that we do not always have timely information about the health and nutritional status of the general population or of particular high-risk sub-groups. The most recent data collected on the nutritional status of Americans, in fact, comes from the Second National Health and Nutrition Examination Survey completed in 1980, over eight years ago. Clearly, we cannot base our public health policies for the current fiscal year on data obtained from surveys conducted many years ago.

This problem is due, in part, to the fact that we have never implemented a comprehensive and coordinated nutrition monitoring system. The legislation before us today would correct this deficiency.

Right now, America's nutrition monitoring system is in dire straits. Even though the Federal Government has been in the nutrition research business since 1893, in 1988 we still do not know the nutritional health status of the American people.

While nutrition information is being collected through 19 different government surveys, the Federal Government has to date been unable to provide an accurate accounting to this Committee of how our tax dollars are being spent on nutrition monitoring.

This is not the first time attention has been drawn to this situation. Various Federal agencies and Congressional committees have made numerous recommendations, submitted proposals, and written reports on the need for a coordinated and integrated nutrition monitoring system.

Nevertheless, we still cannot satisfactorily answer the most basic questions about our food supply, our diets, and our health status, questions that were posed by the White House Conference on Food, Nutrition and Health in 1969 and by the Senate Select Committee on Nutrition and Human Needs in 1977.

Against this background, we must seriously consider the need for a legislative mandate to establish and implement a national nutrition monitoring system. S. 1081, the subject of this morning's hearing, would provide this mandate, and I want to compliment Senator Bingaman, the author of this legislation, for his leadership in this area.

The Committee will carefully consider the legislation, weighing the arguments for and against, and will pay close attention to any recommendations from our witnesses today for improvements to this bill.

I wanted also to announce today that we are releasing a Congressional Research Service report for Congress titled "A National Nutrition Monitoring System: Background and Bill Review," by Donna Porter, specialist in life sciences, Science Policy Research Division of the CRS.[1] So there will be copies available over at the press table and this is being released today for the first time.

We have a statement from Representative Buddy MacKay [2] and a statement from Bread for the World [3] which we will enter into the record at this time.

With that, before we get to our panel, our minority head here, Bill Roth.

OPENING STATEMENT OF SENATOR ROTH

Senator Roth. Thank you, Mr. Chairman. I congratulate you on holding these hearings. Going back to March 1st, the Committee had some very thought-provoking testimony about diet and health, and I think that was a very useful prelude to today's hearing on legislation which is intended to clarify and strengthen the Federal Government's role in determining the nutritional status of the American people and in educating the American people about nutrition.

Now, to those who might question the appropriateness of a government role in these areas, it is worth remembering that for most of this century the Federal Government has regulated the purity and safety of food products sold to the American people, and any claims of health benefits resulting from consumption of particular foods.

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[1] See p. 573.
[2] See p. 457.
[3] See p. 465.

Furthermore, the Federal Government spends billions of dollars annually through the food stamp program, the school lunch program, and WIC, just to name a few, to insure that poorer and more vulnerable people in our country get some good nutrition in their diet.

These programs have benefited from breakthroughs in research that have proven the positive impact of certain diets on the health of Americans. As a matter of fact, the nutrition provided by WIC insures a thriving start on life for many American children.

Historically, Congress has taken legislative steps to establish a national nutritional monitoring system going back to the 1977 farm bill. The question is what is being done now, since progress has not been as fast as some would like.

Ideally, a nutrition monitoring system would be able to give us reliable measurements of the food intake of the American people so that Americans would be healthier and more productive.

What people need is relevant information, once it is translated into numbers that show how much people are eating and what. This data is a relative indicator of diets specific to certain segments of the population. If combined with data on disease frequency for high-risk groups such as low-income infants and the elderly, this information can be used for preventative measures.

Broken down by selective relevant groups such as age, sex, income level, and race, the data can be applied to dietary guidelines and government programs. Promoting a certain diet, however, will not affect all people targeted for a number of reasons.

I noted in the hearing on March 1st that there are variables such as genetic factors and lifestyles that can increase a person's tendency to contract diseases. These factors affect their nutritional needs and complicate the work of those responsible for developing dietary guidelines.

Legislation very similar to the bill before the Committee today was reported by the Committee during my Chairmanship in 1986. During the approximately eighteen months since that bill was reported, the Departments of Health and Human Services and Agriculture have taken more steps to improve nutrition monitoring in the United States. Presumably, these achievements still fall short of what the sponsors of the legislation would like to have seen in place by this time.

Thus, one of the questions I have about the legislation is the extent to which it incorporates what has already been done. Another question I have, given the status of the current effort by USDA and HHS, is about the mechanisms to be established by the bill including the creation of a new advisory committee; are these mechanisms properly designed to facilitate progress rather than simply adding layers of bureaucracy which could impede progress?

I understand and appreciate the concerns of those both in and out of government in trying to develop a functioning and reliable nutrition monitoring system. I look forward to receiving the recommendations of our witnesses today.

Chairman GLENN. Senator Bingaman.

OPENING STATEMENT OF SENATOR BINGAMAN

Senator Bingaman. Mr. Chairman, I will also start by congratulating you on holding this hearing, and I appreciate your cosponsorship of this legislation. I think it is important legislation which has, I believe, passed the House now a couple of times. It has never passed the Senate. I hope that we can correct that this year and get this enacted into law.

I do think its provisions will move us a long way forward in establishing the necessary links between diet and nutrition and health, and in helping us to understand the dietary habits of our citizens so that we can give them the proper advice.

I will not go forward with the rest of my statement. I would like to put it in the record.

Chairman Glenn. Without objection, it will be included in the record.

[Senator Bingaman's statement follows:]

Statement by Senator Bingaman

I. Introduction

Good morning, and welcome to today's hearing on S. 1081, the National Nutrition Monitoring and Related Research Act of 1987. I believe the issue we will investigate during this hearing is crucial to the health and well being of all Americans, and I am grateful to the Chairman of the Senate's Committee on Governmental Affairs, Mr. Glenn, for sanctioning this hearing. I understand that Senator Glenn will join us shortly.

Today's hearing has been a long time in coming and bears out the old adage, "the third time's the charm." I say this because this is the third Congress in which I have introduced comprehensive legislation on nutrition monitoring, but it is the first Congress in which a Senate hearing has been held on the subject. I am pleased to be able to chair this long-awaited hearing in Senator Glenn's absence.

II. Body: The Need for Legislation

Today's hearing is particularly important because its record will help the members of Congress determine whether there is a need for the type of national nutrition monitoring system that S. 1081 would establish.

A. WITNESS FOCUS

To make this determination, we must examine the programs and activities currenty underway. Specifically, I am hopeful that today's witnesses will focus on seven key components of current nutrition and dietary guidance programs:

(1) Status and results of current surveys;

(2) Current budget for the various surveys and programs;

(3) Current methods research;

(4) Current program coordination, both between federal departments and between the federal government and the private sector;

(5) Current interaction between federal agencies and state and local governments;

(6) Current data-output: The dissemination of useable information to consumers; and

(7) Inclusion of high-risk groups (Hispanics, Native Americans, the poor) in data collection and analysis.

B. CURRENT SYSTEM

Despite considerable nutrition-related information from various sources, both within and without the federal government, the fact remains that we do not have a comprehensive nutrition monitoring program. The embarrassing result simply is that we do not know the current nutritional status of our citizens. And without knowledge of this fundamental component, how can we develop programs to encourage safer, more nutritious food consumption nationwide or to deal with disease identified with dietary habits?

I believe we can lay the groundwork for a truly coordinated national data-gathering program only through a Congressional mandate, such as S. 1081.

1. Federal departments involved

Currently, at least three federal Departments—the Department of Agriculture, the Department of Health and Human Services, and the Department of Commerce—collect data and conduct nutrition research and training. This is accomplished through more than nine federal agencies and 19 different surveys. Some estimates put the cost of this activity at more than $200 million.

Given such disparate data collection, analysis, and reporting it is no wonder that we need an integrated approach. Indeed, in a 1985 report to the President and Congress, the National Agriculture Research and Extension Users Advisory Board stated that because of poor coordination among the appropriate federal agencies, each agency, ignored opportunities "to economize and perhaps make the results more conclusive." More recently, the Hunger Task Force, appointed by President Reagan, recommended that the USDA and the DHHS coordinate their surveys on a continuous and timely basis.

2. Data timeliness

A second deficiency of our nutrition monitoring efforts in the recent past has been the lack of timely data. This issue becomes more critical when one considers that we in the Congress often rely upon this data when deciding whether to vote for or against health care, food assistance, food and environmental safety, agriculture production, and biomedical research.

Can we make informed decisions without current baseline data on the nutritional and health status of the U.S. population? Can we possibly know whether our current policies are having the intended effect, or whether we should be making crucial changes that would be evident if only we had better information?

Throughout this Congress, the decisions we have been making have been based largely on data collected in the 1970s. Clearly, a more complete understanding of the relationship between diet, nutrition, and health would pay off in increased knowledge and sound fiscal savings.

S. 1081 PROVISIONS

To accomplish these objectives, we must streamline the administrative functions of federal nutrition monitoring programs. S. 1081 would do this. It would consolidate administrative authority within an Interagency Board that would assist the Secretaries of the Department of Health and Human Services and the Department of Agriculture in the development, management, and implementation of a coordinated program and a comprehensive 10-year plan.

An Advisory Council would be appointed by the President and the Congress to provide scientific and technical advice on the development and implementation of a national nutrition monitoring program.

And in our current fiscal climate, I am compelled to state that this all may be accomplished without the authorization of new funds. This is because, through administrative in-house restructuring, greater efficiency can be achieved.

III. Conclusion

This restructuring will ensure the effective use of federal and state funds. It will help develop state and local initiatives to improve monitoring methods and standards. It will stimulate academic, industrial, and governmental partnerships.

And, most importantly, it will help ensure that the American public receives the most up-to-date and comprehensive dietary guidance possible so that healthful diet decisions may be made.

With these thoughts in mind, I want to thank you all for your attendance, and I look forward to an excellent morning of testimony.

Chairman **GLENN**. We have two Members of Congress, one Senator, one from the House of Representatives. The Honorable Rudy Boschwitz, U.S. Senator, and the Honorable George E. Brown, Jr., United States Representative, will be along some time this morning. They were going to lead off our hearing this morning. They have not arrived as yet. We will take them when they come because of their other busy schedules here.

So our first panel this morning will be Dr. Michael McGinnis and Mr. John Bode. Dr. McGinnis is the Deputy Assistant Secretary for Health within the Department of Health and Human Services. He also serves as the Director of the Office of Disease Prevention and Health Promotion at Health and Human Services.

Mr. Bode is the Assistant Secretary for Food and Consumer Services within the Department of Agriculture.

Gentlemen, we look forward to your testimony. Your entire statements will be included in the record, if you choose to summarize them or give an abridged version, and do whichever you like.

I understand there was time conflict here. Mr. Bode, we will take you first this morning, and would you introduce whoever it is you brought with you here this morning?

TESTIMONY OF JOHN W. BODE, ASSISTANT SECRETARY FOR FOOD AND CONSUMER SERVICES, U.S. DEPARTMENT OF AGRICULTURE,[1] ACCOMPANIED BY SUZANNE HARRIS, PH.D., DEPUTY ASSISTANT SECRETARY, FOOD AND CONSUMER SERVICES

Mr. BODE. Yes, Mr. Chairman, I would be pleased to. I am John Bode, Assistant Secretary of Agriculture for Food and Consumer Services. With me today is Dr. Suzanne Harris, Deputy Assistant Secretary for Food and Consumer Services.

With your permission, sir, I will summarize my testimony.

I am pleased to be here today to share with you the Department of Agriculture's views on S. 1081, the National Nutrition Monitoring and Related Research Act. We share your views about the importance of the national nutrition monitoring system. We also feel that five to ten years ago, those who complained about the lack of coordination and timeliness of the system were justified.

At that time, USDA was collecting food consumption data only every ten years and the reporting and analysis of these data were slow. There was little coordination between the Department of Agriculture and the Department of Health and Human Services, but that is not the case today, in part because of the continuous interest in the system by the Congress.

It is important that we focus our attention on the nutrition monitoring system as it is today rather than as it was in the late 1970s and early 1980s. Today, USDA has continuous monitoring activities.

Beginning in 1985, we conducted surveys designed to identify trends in food consumption patterns. These were focused on high-risk groups, low-income women and their children, as well as an all-income sample of women 19 to 50 years and their young children. A similar survey was conducted in 1986. Data release began six months after data collection was completed, and we will complete the release of these data this year.

We are currently in the field with the 1987 Nationwide Food Consumption Survey (NFCS), which collects individual dietary intake data for three consecutive days from a nationally representative sample of the whole U.S. population, with a separate low-income sample.

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[1] See p. 260 for Mr. Bode's prepared statement.

In April 1989, we will begin the Continuing Survey of Food Intakes by Individuals (CSFII), again utilizing the continuous, moving average concept for the whole population and for a separate low-income sample.

Both the 1987 NFCS and the 1989 through 1996 CSFII will be more fully comparable with the third National Health and Nutrition Examination Survey. These surveys will use the same food codes and nutrient composition data base. Their questionnaires were compared to ensure the maximum comparability among variables. Data collection methods and report documentation are being scrutinized to increase comparability.

We hope that all will agree that these are the outcomes S. 1081 is designed to obtain. We have a comprehensive plan, the 1987 Operational Plan delivered to Congress last August. We have designed a management structure, the Interagency Committee for Nutrition Monitoring, which I am privileged to co-chair along with Dr. Windom, Assistant Secretary for Health at HHS.

This Committee will facilitate coordination to achieve a truly comprehensive and fully coordinated network of monitoring activities. We have a reporting mechanism for Congress in place and will continue to provide summary reports based on the total body of monitoring data at regular intervals.

We have been and will continue to work with State and local officials to provide technical assistance. We are also working to improve the research direction given to the USDA Human Nutrition Research Centers so that we can continue to improve methods and standards used in these surveys.

With respect to what S. 1081 would provide that we do not currently have in place, I think without substantial new appropriation, the bill's outcome would be an advisory committee, two additional reports to Congress each year, and some budgetary figures.

While we certainly value input from the private sector about the monitoring system, we are focusing on a broader and more flexible structure to encourage such input as opposed to the formal advisory council system.

As for the reports, we are very interested in keeping Congress fully informed of our plans and progress. We plan to continue our practice of the last few years of regular communication with the various committees that have expressed interest in monitoring.

We have chosen these avenues because they provide the same outcomes as the mechanisms afforded through S. 1081, but do not present as much of a burden to the agencies involved. Funds and staff are, of course, precious, and I am sure that all will agree that these resources should be invested primarily in data collection and analysis.

Aside from these procedural concerns, we also have concerns about some of the language used in S. 1081. For example, one component of the comprehensive plan is a survey that collects statistically reliable estimates for all the various high-risk groups with respect to geo-political and geographic areas.

Collecting food consumption data annually in every State or county would be a prohibitive undertaking. It is unclear what is meant by nutritional quality of the food supply. Though I will concede it would be far-fetched, this could be construed as requiring lists of good foods and bad foods. For these reasons, the Department of Agriculture does not support enactment of S. 1081.

S. 1081 also refers to dietary guidance. USDA has a long tradition of human nutrition research and of translating these research findings into usable information for the healthy American public.

The Food and Agriculture Act of 1977 designated USDA as the lead agency of the Federal Government for research, extension, and education in the food and agriculture sciences, which, by definition, included human nutrition. So we have a strong commitment there.

We have taken seriously the direction of the House Appropriations Committee to encourage the Federal Government to speak with one voice when issuing dietary guidance. The one voice is that of the Dietary Guidelines for Americans, which contain qualitative guidance for the healthy American public.

USDA has an ongoing nutrition education program based on these guidelines and has enjoyed a very good working relationship with the Department of Health and Human Services in this area, as well as others in the nutrition field.

We appreciate the opportunity to appear before you, Mr. Chairman, and this Committee, and look forward to answering any questions that you have.

Chairman GLENN. Thank you. I think we will have the other testimony first, Dr. McGinnis, and then we will get to questioning.

TESTIMONY OF J. MICHAEL McGINNIS, M.D., DEPUTY ASSISTANT SECRETARY FOR HEALTH, OFFICE OF DISEASE PREVENTION AND HEALTH PROMOTION, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Dr. MCGINNIS. Thank you very much, Senator. I am Dr. Michael McGinnis, Deputy Assistant Secretary for Health in the Department of Health and Human Services, and Chair of the Department's Nutrition Policy Board.

With me today behind me are Dr. Catherine Woteki from the Centers for Disease Control's National Center for Health Statistics, Dr. Allan Forbes from the Food and Drug Administration, and Dr. Darla Danford from the National Institutes of Health, who will also be available for questions and followup.

If I may, I would like to submit my formal testimony [1] for the record and speak less formally from notes.

Chairman GLENN. Without objection, it will be included in the record.

Dr. MCGINNIS. Thank you.

I would like to cover three general topics briefly: first, what we do in nutrition monitoring; second, discuss some recent findings from our work; and, third, review progress made in the last several years in that work.

First, what we do. What we do in nutrition monitoring is summarized, I think, quite nicely in the operational plan for the National

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[1] See p. 320.

Nutrition Monitoring system that Mr. Bode mentioned in his testimony.

This was submitted to Congress in August of last year and I would like to formally submit it for the record for this hearing today.[1]

Chairman GLENN. It will be included.

Dr. MCGINNIS. That plan noted five components to the National Nutrition Monitoring System: one, health and nutritional status measurements; second, food consumption measurements; third, food composition measurements; fourth, dietary knowledge and attitudes assessment; and, fifth, food supply determinations.

The last category—that is, food supply determinations—is entirely the purview of the Department of Agriculture. The Department of Health and Human Services is a prominent contributor to the first four of those items and I would like to summarize our activities in each of them.

First, health and nutrition status measurements. Through the National Health and Nutrition Examination Survey, the Department of Health and Human Services is responsible for health and nutrition status measurements of the National Nutrition Monitoring System.

NHANES, as it is called, is conducted by the Centers for Disease Control, as is the Coordinated States' Surveillance System, which provides information on high-risk pediatric and pregnant populations. It is the survey that helps to improve the growth charts that we all use to assess the development of our children.

Other surveys of the National Center for Health Statistics which contribute to this component include the National Survey on Family Growth and the National Survey on Maternal and Infant Health.

The pillar of the system is NHANES, and NHANES III is the component of that survey which will go into the field later this year. It will provide data on a wide range of biochemical and other measurements of health status, as well as food intake information. This round will allow special insight into the situation of blacks and Mexican Americans.

Let us turn now to food consumption activities. The Department of Health and Human Services measures food consumption through a variety of means, including the 24-hour dietary recall component of NHANES, as well as the Food and Drug Administration's Total Diet Study and surveys of vitamin supplement usage.

Food composition: The FDA Total Diet Study also gives information on food composition of representative meals, and other composition information comes from FDA's Food Label and Packaging Survey.

Dietary knowledge and attitudes: The National Center for Health Statistics' Health Interview Survey provides important information on dietary knowledge and attitudes of the American public, as does the Food and Drug Administration's Health and Diet Survey and the Infant Feeding Practices Survey.

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[1] See p. 646.

The National Institutes of Health has also made important contributions through its cholesterol awareness campaign and the attendant surveys, as well as the high blood pressure awareness surveys. All of these provide extensive information around this very complex issue.

Let us turn to results very briefly. I would like to give you some recent examples of information that has come from, in particular, the health and nutritional status components of the surveys that I mentioned.

For example, serum cholesterol levels have declined significantly among adult men and women, but mean levels still exceed the desirable level of less than 200 milligrams per deciliter, and about 57 percent of adults ages 20 to 74 years have levels higher than 200 milligrams per deciliter.

This is important because of the impact of serum cholesterol levels as an indicator of aggregate fat and cholesterol intake which is important to the occurrence of cardiovascular disease, cancer, and obesity, our leading health threats in the Nation.

Obesity continues to be a prominent nutrition-related problem among adults. NHANES data show that approximately 25 percent of Americans are overweight. Among women, rates of obesity are much higher among those who are black than those who are white.

Another item indicated by the surveys is that Vitamin A status for the vast majority of the population is adequate. However, for Hispanics, inadequate intakes may exist. Iron status for most of the population is satisfactory. An addition of more iron to the food supply is not warranted, according to our survey. Impaired iron status occurs more frequently among women of child-bearing age and young children, with the highest prevalence occurring among minority groups and those living below the poverty level. But intervention programs appear to be working. The prevalence of anemia among children from lower-income families residing in six States participating in the Pediatric Nutrition Surveillance System declined by 60 percent between 1975 and 1985.

There is obviously a much broader range of data available, but I wanted to give you just a sample of the recent information that has come out of these surveys.

The last item I would like to address is progress. Progress has been substantial in nutrition monitoring in the last several years, both in scope and conduct of our own work within the Department of Health and Human Services and in coordination with USDA and other partners in this work.

In our own work, NHANES has developed a sophisticated automated data system that should help us to speed the output of data and reports. We have added a longitudinal component to allow follow-up over a long period of time of study subjects and long-term specimen banking as well. We have added, in addition, a special sampling of infants, children, elderly, blacks and Hispanics to give additional information on those groups.

The expanded Cooperative State Surveillance System will become more nationally representative and give us a wider range of data on the indices that are included in NHANES surveys.

New dimensions have been added to our capabilities with the expanded CDC Behavioral Risk Factor Surveillance Survey, the FDA surveys, and the addition of the National Heart, Lung, and Blood Institute and National Cancer Institute surveys on consumer awareness and activities related to nutrition.

With respect to our coordination with USDA, I would like to reemphasize a few points that were made by Mr. Bode. We have established regular meetings between the two principal assistant secretaries in the departments concerned. Those meetings occur approximately quarterly.

We have set up a special policy level ad hoc committee co-chaired by the two principal deputy assistant secretaries concerned with these issues in USDA and HHS to make sure that we are working closer on these issues. The committee met, for example, five times in 1987, in addition to the many meetings that were held at the staff level between the National Center for Health Statistics and the Human Nutrition Information Service staff at USDA.

Those staff meetings occur quarterly and they have implemented several steps, including use by Hispanic HANES of HNIS nutrient data base and food codes, agreement on common age groups for NHANES III and the Nationwide Food Consumption Survey, and linkage on some 19 socio-demographic variables.

We have coauthored with USDA the first comprehensive report on nutrition monitoring in the United States, which was transmitted to Congress in July of 1986, and work is well underway to develop the second such report.

We have completed a broad review of nutrition research needs under the Interagency Committee for Human Nutrition Research, co-chaired by USDA and HHS assistant secretaries, with a specific focus included on the nutrition monitoring research needs as well.

We have, as Mr. Bode noted, agreed to establish an interagency committee on nutrition monitoring, again co-chaired by HHS and USDA, but involving agencies from across the Administration, including the Departments of Defense and Commerce, the Veterans Administration, the National Science Foundation, AID, and so forth.

Still, there is much to be accomplished. A review that we initiated recently, for example, of our own efforts to monitor nutritional status of low-income populations revealed deficiencies that need to be corrected. There are other improvements needed in increasing the comparability of data among all the surveys, so we welcome the Committee's interest.

I will not belabor the reasons that the Administration opposes -S. 1081, which Mr. Bode has so nicely summarized. We are all interested in keeping the superstructures to a minimum.

On the dietary guidance component of the bill, HHS is proud of its efforts to provide the public with up-to-date dietary guidance, and pleased to share co-leadership with USDA for the national efforts in this respect. That collaboration, as Mr. Bode mentioned, has proved fruitful to date and we anticipate it will continue to grow in the future.

I would like to conclude by emphasizing the Administration's interest in and commitment to working with you and the Committee to enhance our efforts to monitor and improve the nutritional status of the American people.

Thank you for the opportunity to join you.

Chairman GLENN. Thank you very much. Let me get right to the questions. You have talked about the cooperation and the fact that you have co-chairs, as it were, and I am a little bit concerned about that. I do not want to see something that is a hydra-headed monster here. Somebody has to have the lead in this thing.

Our Committee has heard reports that there has been some interagency disagreement between your agency and USDA over who is really the lead agency for nutrition monitoring. Now, I believe USDA has said that they consider themselves to be the lead agency for nutrition monitoring.

I guess the obvious question would be, Dr. McGinnis, do you consider USDA to be the lead agency for nutrition monitoring?

Dr. MCGINNIS. Well, I think that there is really very little disagreement on that issue, the issue of nutrition monitoring. I think that both agencies consider this a co-lead. We clearly do not view USDA to be the lead, nor do they view us to be the lead. I think that there is general agreement that it is a co-leadership responsibility.

Chairman GLENN. Is that correct? Is that your view, Mr. Bode?

Mr. BODE. Moreover, Senator, we do not view USDA to be the lead. I am afraid I do not understand where the information you were provided came from.

Chairman GLENN. Somebody has to direct all this interagency cooperation that I keep hearing about, but we do not see much action on, quite frankly.

Mr. BODE. Well, we do believe that it is a shared role. I think the Operational Plan that Dr. McGinnis referred to and I also mentioned in my testimony, spells out those roles in some detail.

I think the working relationship that USDA and HHS have is a very good one. We have talked a lot about the formal relationships and how those have provided us opportunities for timely issue resolution. We also have very good informal working relationships where we pick up the phone very frequently and take care of resolution of issues.

I do not want to give you the impression that there is always unison of thought. Differences sometimes develop and they are resolved in a timely way, and I think that is the way this system can best work.

Chairman GLENN. Well, let me approach it from a different angle. What is the Department of Agriculture's current level of spending on nutrition monitoring?

Dr. HARRIS. If you look at nutrition monitoring activities alone, most of that, or almost a hundred percent of that is conducted by the Human Nutrition Information Service of USDA.

Their budget in 1988 is about $7 million. Of that, about $5.5 million is for nutrition monitoring activities alone.

Chairman GLENN. Now, would that include the surveys and methods research and coordination with other agencies? What would be included in that $7 million?

Dr. HARRIS. The $7 million is the agency's entire budget, which includes some nutrition education activities. From the nutrition monitoring aspect, that does include the actual data collection and analysis. It includes coordination activities, it includes some research in methodology and food composition information.

Chairman **Glenn**. Have you made any estimate, or have any of you made an estimate of what it would cost to meet the requirements of this bill that we are considering?

Dr. **Harris**. I can speak only for USDA. A couple of years ago when this bill was before another committee we made an estimate. It is totally dependent on how you interpret the language of the specific recommendations in the comprehensive plan.

If you do that one way, we came up with a figure of $15 million annually. If you do it another way, we came up with an additional $7 million annually. That is for USDA's activities in food composition and food consumption surveys only.

Chairman **Glenn**. That would be in addition to the current $7 million you spend?

Dr. **Harris**. That is correct.

Chairman **Glenn**. So that would bring your total, then, if we passed this bill up to around $22 million or something in that area, correct?

Dr. **Harris**. Correct. Again, that is not DHHS' costs at all.

Chairman **Glenn**. Dr. McGinnis, could you explain for the record how the various non-NHANES nutrition monitoring activities conducted by the—we have the Centers for Disease Control, we have the National Institutes of Health, we have the Food and Drug Administration. How are all these coordinated within the National Nutrition Monitoring System with the USDA's Continuing Survey for Individual Intakes, the CSFII?

That is a number of different groups doing work here. That is the reason that I am concerned about the multiple heading of this thing that both of you gentlemen agree is the case right now. We have a number of different agencies doing work in this.

It would seem to me we would almost have to have someone be the lead agency. You cannot do this all by occasional phone calls back and forth, as Mr. Bode indicated is done, and I appreciate the fact that there is a lot of coordination back and forth. There would have to be, but it would seem to me if we have a well coordinated effort, it would have to be with somebody taking the lead and really laying out a solid program and then everybody getting in line and carrying that out.

Dr. **McGinnis**. The current mechanisms for coordination within the Department of Health and Human Services are principally through the Departmental Nutrition Policy Board, which spans all the agencies within our Department.

In addition, coordinating activities between the Department of Health and Human Services and the Department of Agriculture are undertaken at three levels: first, the quarterly meetings between the assistant secretaries, at which broad policy issues are discussed; second, the regular meetings between the deputy assistant secretaries who have direct responsibility in the areas to try to work out policy-related nuts and bolts issues; and, third, regular meetings between the staffs of the principal surveys including those the National Center for Health Statistics runs, the NHANES, and the Human Nutrition Information Service Survey, and the Nationwide Food Consumption Survey staff.

Chairman **Glenn**. Mr. Bode, your Department has objected to the bill, contending that it would create an unwieldy—that is your word—bureaucracy. A review of the data from the surveys you conduct is already contracted to an outside advisory committee, the Federation of American Societies for Experimental Biology.

You have said today that you are preparing to establish the Interagency Committee for Nutrition Monitoring. It would seem to me the objectives of this committee seem very similar to those of the proposed Interagency Board for Nutrition Monitoring.

How would the bill create any new levels of management that would delay implementation of a comprehensive system?

Mr. BODE. Sir, I think it is basically a matter of how much superstructure is drawing resources away from the activities that we are all concerned about here, the substantive nutrition monitoring activities.

It is our assessment that what we have outlined is a more effective and more efficient way to seek outside input and get those same objectives—I think the objectives are shared—addressed.

Dr. Harris might want to add to that a bit.

Dr. HARRIS. The committee that you referred to, of the Life Sciences Research Organization, is a committee that is doing a special function for both departments. It is necessary to put all of the data together and to come up with a summary statement, if you will, of what all of the different survey data mean. That is their function.

That function is also required by the bill. S. 1081 requires every two years for us to produce a scientific report which summarizes the data that come out of the various monitoring activities.

What we do not now have in place is a formal advisory committee, which is Title II of S. 1081. This advisory committee was, according to the bill, to provide technical support for us. We do not have such an advisory committee in place.

It is USDA's feeling that an eleven-member committee, so specifically drawn as the one in the bill, would require a considerable amount of time and effort spent to bring them into full knowledge of USDA's activities and to put them in a position to make good technical recommendations to us.

That would come at the same time when our staffs are busy with actual data collection and data analysis activities. We do not have extra people, and that is where the burden comes in.

Chairman GLENN. Well, I would presume that anyone appointed to that group would be someone that is pretty knowledgeable in the field to begin with. You would not just be bringing people in off the street to get your eleven-member group.

Dr. HARRIS. I understand that, sir.

Chairman GLENN. They would be familiar with your activities and with Health and Human Services, and so on. They should be people pretty familiar. I would not think it would take much effort to get them up to speed.

Mr. BODE. Sir, I think they would certainly have expertise in the field. However, that would not necessarily provide them the specific knowledge about existing activities that Dr. Harris, I believe, was referring to. It would entail a significant amount of time and effort to keep eleven members of the committee informed and also bring them to resolution on issues.

Chairman GLENN. Are the other provisions hard for you to accept? It would seem to me this would fit right in with what you are trying to do. In the Joint Operational Plan your department and DHHS submitted for the National Nutrition Monitoring System in 1987, you highlight three principal goals, and these are, one, to achieve a comprehensive system through coordination among the system's components; two, to improve information dissemination; and, three, to improve the research base for nutrition monitoring.

Since these objectives are essentially the same ones as those of S. 1081, I would think this would lock it in so there cannot be any doubt about a future secretary or a future President or whoever giving proper credibility to a group like this.

I just think it would lock it in, where now it is left up to somebody to establish or disestablish whatever committees or groups they may see fit to do or not do.

Mr. BODE. Senator, I believe as our actions reflect, there is certainly no animus on our part toward nutrition monitoring. We are committed to a strong nutrition monitoring effort and close work with the Department of Health and Human Services and others in that effort.

We are concerned about drawing resources away from those monitoring activities, as I have previously mentioned. We have serious concerns about ambiguities in the language, and I think those are primary concerns.

I think Dr. Harris might want to elaborate just a bit.

Dr. HARRIS. What Mr. Bode has said is our position. We do want a good nutrition monitoring system and we are working diligently to achieve that. The bill does lock in a number of things and that might not be the best thing to do.

This is a very dynamic field. We are learning things every day and I, from my own perspective, see that having a system that is less locked into a specific set of rules and regulations in the law would be more helpful.

We might find down the road that we do not need to do a Nationwide Food Consumption Survey and that sort of thing. I do not know at this point, but we would not have that flexibility.

Chairman GLENN. Thank you. The red light is on. My time is up here.

Senator HEINZ. It may not be my time, but could I make a unanimous consent request?

Chairman GLENN. Sure.

OPENING STATEMENT OF SENATOR HEINZ

Senator HEINZ. Like many of my colleagues, I have an embarrassingly full schedule. In addition to this hearing, there is a 9:45 Republican Caucus in S-230. There is a 10 o'clock hearing in the Banking Committee on the Community Reinvestment Act, and there is a 9:30 hearing in the Health Subcommittee of Finance in S-1673, Senator Chafee's Medicaid Community Policy Services Act. If I can get to all the hearings, I will be doing a better job than I am describing them.

I just want to say that I commend you, Senator Glenn and Senator Bingaman, on the Nutrition Monitoring and Related Research Act, S. 1081. In my judgment, there is an overwhelming need for accurate, timely and useful information on diet and nutrition that it would provide.

Having reviewed the testimony from our previous witnesses and, I might add, recognizing the strong support of constituents of mine such as Pat O'Malley, I have decided to cosponsor S. 1081. I would like to ask, Mr. Chairman and Senator Bingaman, to add my name as a cosponsor.

Chairman GLENN. Good, fine.

Senator HEINZ. And I would ask that the rest of my remarks go in the record.

Chairman GLENN. They will be included in the record in their entirety. Good.

Senator HEINZ. Thank you, Mr. Chairman.

Chairman GLENN. And get your track shoes on.

[The statement of Senator Heinz follows:]

PREPARED STATEMENT OF SENATOR HEINZ

Mr. Chairman, I am pleased that the committee is moving forward on S. 1081, "The Nutrition Monitoring and Related Research Act." There is an overwhelming need for accurate, timely and useful information on diet and nutrition. After reviewing the testimony from our previous witnesses, and recognizing the strong support of constituents such as Pat O'Malley, I have decided to cosponsor S. 1081, and would like to ask Chairman Glenn and Senator Bingaman to add my name as a cosponsor.

Good nutrition has been identified as playing a lead role in the body's fight against disease. During the committee's first hearing on nutrition monitoring, witnesses testified about the critical link between diet and a healthy life. Most importantly, these experts agreed that diet is most crucial for both the very young and the very old.

Dr. Irwin Rosenberg reported to the committee that eighty percent of older Americans have at least one chronic condition including osteoporosis, hypertension, heart conditions, and arthritis. Many of these health problems are affected by dietary habits over a lifetime.

Dr. Myron Winick told the committee that ensuring adequate nutrition during pregnancy could help to bring an end to the national scandal of infant mortality and low-birth weight.

As a nation, we have recognized this link between diet and health through the establishment of programs including school lunch, the special supplemental feeding program for women, infants and children (WIC), and food stamps. These Federal priorities address the nutritional needs poor Americans who are often nutritionally "at-risk". Yet, Federal data collection efforts often fall short of providing the proper information to evaluate and improve these programs. This information is critical to making informed choices as policymakers.

For example, Congress mandated a study of the Medicaid cost savings during the first two months of life for WIC program newborns last December, as part of the continuing resolution. Congress was concerned because Federal studies have not been directed toward program improvements, or the benefits of WIC participation on short- and long-term health costs.

In 1984, the Harvard School of Public Health found that each dollar invested in prenatal nutrition through WIC saves $3 in the hospital costs of neonatal care. These impressive statistics might be improved and Federal resources better spent, however, if we examine variations in food packages, outreach, and counseling among States.

The Senate Appropriations Committee also urged that studies be coordinated with other Federal agencies to provide information necessary to improve this critical program. One of the goals of S. 1081, is to establish this type of coordination for all Federal nutrition programs and research on a permanent basis.

In addition, I would like to welcome Patricia O'Malley of the Pittsburgh Hunger Services Network who will testify about her extensive experience with food programs in Pennsylvania and the need for a national system of nutrition monitoring.

Thank you, Mr. Chairman.

Chairman **Glenn**. We have been joined by Congressman George Brown. We are glad to have him with us this morning. We will let Jeff—he has not had his questioning period yet. If you have time, George, we will go ahead and do that and then get to your testimony here.

I only had one further comment on this. Where no one person has lead authority, has the authority to get something done, where they have the responsibility and the authority together, it has just been the experience in government and other organizations I have been in that we just do not really get things done.

Someone has to have the sack; someone has to be the lead and then require things of those working on the programs under them. You know, the old example of what I am talking about is the description of a camel; that was a horse that was built by a committee.

That is not completely facetious or it is not completely out of line, I think, here because someone has to have the responsibility and the authority and the budget to go with it and administer it, I think. Where that is going to be, I do not know, but it just seems to me that is rather fundamental.

Senator Bingaman.

Senator **Bingaman**. Thank you, Mr. Chairman. Let me start with a general question. When I hear Mr. Bode's comments, I gather that everything is sort of working itself out and there are no major problems. That seems to be the message.

The report from CRS summarizes the criticisms pretty well. On page 42 it says, "Proponents of this legislation"—I happen to be one of those—"criticize current efforts as being uncoordinated, lacking adequate accountability, being untimely, using imprecise and nonstandardized assessment methodologies, giving inadequate attention to assessing high-risk groups in geographic areas, and failing to effectively use available resources." There is obviously a difference of opinion on how well we are doing.

I would like to be a little more specific on some of the items there. Is it true that the data we are using today was collected by 1980 or before; that we are eight years behind or nine years behind in having current data for policymaking? Is that accurate?

Mr. **Bode**. No, sir, I do not think so.

Why do you not go ahead, Dr. Harris?

Dr. **Harris**. I think that the written testimony that Mr. Bode has submitted goes into great detail explaining the survey activities USDA has conducted in the last three years. In 1985 and 1986, we conducted the Continuing Survey of Food Intakes by Individuals. This was a new survey designed to address the specific complaints listed here on page 42.

Senator **Bingaman**. Now, we have the results of that?

Dr. **Harris**. Yes, sir, you do.

Senator **Bingaman**. Okay.

Dr. **Harris**. They are in blue and white books.

Senator **Bingaman**. And you think those correct the——

Dr. **Harris**. No. They are a beginning; they are a first step in that area. We are currently in the field with the Nationwide Food Consumption Survey, which is the large decennial survey.

In April of next year, we will begin the CSFII survey again in a little different format, so that we will on an annual basis collect data from the entire population on dietary intake.

Senator BINGAMAN. Let me ask Dr. McGinnis if he would comment as to the timeliness of the information that we are receiving, or the people in policymaking positions are receiving, about nutrition.

I have the distinct impression from the little I have read that we are very slow to find out anything from these surveys.

Dr. McGINNIS. Well, I think that historically there has been a real problem in timeliness; that, in fact, there have been delays. Certainly, I can speak to the problems of our own Department in getting data out from NHANES, especially in the first go-around of NHANES from 1971 to 1974 and some of the other surveys as well.

But I think that to a substantial extent, with automated systems, we are in the process of correcting this problem. We have already corrected it to some extent. With the Hispanic HANES, for example, which was done within this decade, the data have come out on a much more timely fashion.

A more serious problem—not to dismiss the timeliness issue—is the comparability of the data among surveys, and that is an issue that we are also working on. Clearly, in order to make these data as useful as they possibly can be, we need to ensure that our various data collection efforts are comparable, regardless of whether they are data collection efforts within DHHS or between DHHS and USDA.

Senator BINGAMAN. And the data collection efforts going forward today are not comparable in the various agencies? Is that what you are saying?

Dr. McGINNIS. They are more comparable than they used to be, but it is true that they are not entirely comparable.

Senator BINGAMAN. Let me ask Dr. McGinnis about the amount being expended in the area of nutrition monitoring. I think Mr. Bode testified that $5.5 million now was being spent in the Department of Agriculture on nutrition monitoring.

What is your understanding of the amount that is being spent in your department or throughout the Federal Government in this area?

Dr. McGINNIS. In our Department we spent last year roughly—or an average over the last several years of roughly $38 million a year for nutrition monitoring and related research.

It is important to emphasize the last clause, "related research" because a substantial amount is going into the related research component. Monitoring alone is somewhere on the order of $12 million this year for nutrition monitoring efforts.

Senator BINGAMAN. Twelve million dollars?

Dr. McGINNIS. Yes.

Senator BINGAMAN. On the issue of child nutrition, do we have any kind of accurate information on a timely basis about the status of child nutrition in the country? Is that something that the Department of Agriculture has prepared? Have you submitted that to us?

Mr. BODE. Yes. We collected data in the Continuing Survey on Food Intakes by Individuals.

Senator **Bingaman**. That is the one that is going in the field now?

Mr. **Bode**. No.

Senator **Bingaman**. That is the one that was done in 1985 and 1986?

Mr. **Bode**. Yes, and will be resumed in April of next year. It collected data on the nutritional intakes by children ages one to five. That group was selected, along with their mothers, because they were viewed as a very nutritionally vulnerable group, and so we collected information there.

Senator **Bingaman**. What about school-age children?

Dr. **Harris**. The Nationwide Food Consumption Survey, which is in the field this year, does collect data on school-age children, and we will begin reporting those data by December of 1988.

Senator **Bingaman**. December of 1988?

Dr. **Harris**. Yes, sir.

Senator **Bingaman**. Okay.

Dr. **Harris**. This December. We have not collected all of the data yet, so we cannot begin to report it until we have done that.

Senator **Bingaman**. Let me ask some more specifics on this food intake survey that you are talking about. Can you tell me how large that sample was?

Dr. **Harris**. The CSFII sample in 1985 and again in 1986 was around 1,500 women and their children, and that worked out, I think, to around 700 children. The children were ages one to five; the women were 19 to 50 years of age each year.

Senator **Bingaman**. When you are trying to assess nutritional status and food intake for the Nation, is it enough to have a sample of 700 children?

Dr. **Harris**. That was a nationally representative sample of children, yes, sir. The sample was based on the women. They were the focus of the survey and we picked up their children, but the sample size was large enough to make general recommendations or conclusions about children ages one to five.

Now, you cannot break it down much below that. We cannot talk about Hispanic children or Asian children, but as a group we can talk about children.

Senator **Bingaman**. But you think that that size sample was adequate for the purposes of the study—what was the purpose of the study?

Dr. **Harris**. The purpose of the study was to look at whether dietary patterns were changing in the United States. We compared the data to the last decennial survey, which was in 1977, and indeed we did find changes. We found some dramatic changes.

We found that women and their children were eating as well or better as they were in 1977, but the actual foods they were eating had changed somewhat. For example, the women were eating more low-fat milk and were eating less red meat. This did not necessarily translate, however, into a lower fat intake in their diet.

Senator **Bingaman**. Okay. Is this the same size sample you are using next year?

Dr. **Harris**. In 1989, yes. The CSFII sample size will be around 1,500 collected annually. Now, it will be different. It will not be just women and their children. It will be a sample pulled from the entire population. It will take us about two years to build a reportable sample size.

This is the moving average concept that the National Academy of Sciences recommended. It will take about two years for us to make a sample size large enough to report on all women or all men. Then after two or three more years, we can break it down much as NHANES is doing and give you other breaks in the population, white versus black, and so on.

Senator BINGAMAN. Let me bring this down to a specific that affects my own State of New Mexico. We have about 120,000 or 130,000 Navajo Indians in the country; it is the largest tribe. Type II diabetes is at epidemic proportions; at least that is what the Indian Health Service tells me.

Dr. HARRIS. That is right.

Senator BINGAMAN. To what extent have you done surveys, or is it appropriate for you to do surveys, on the nutritional status of Indian children growing up in Indian society or the general population so that we could begin to deal with this problem?

As I understand it, Type II diabetes is a disease that is directly traceable to diet, or there is a high correlation to diet.

Dr. HARRIS. It would be appropriate for us to do a dietary survey. The nutritional status survey where you are looking at their actual body chemistries, and so on, would be the purview of DHHS.

If it were determined that such a survey is an appropriate thing for the monitoring system to do—and that is something that the Board could decide, that we wanted to go out and look at Indian populations on reservations—then it should be a venture that we would do together.

We would provide expertise in the dietary status data collection and HHS could provide the rest of the expertise in measuring the health status.

Senator BINGAMAN. Dr. McGinnis, maybe you could comment on the questions I have asked, and also, to your knowledge, are we picking out these high-risk groups, such as the Navajos, and actually collecting the dietary information and the nutritional information that we need to make informed policy decisions?

Dr. MCGINNIS. The answer to that is mixed. We conducted last year a review of our efforts targeted to assessing the nutritional status of low-income populations, for the reasons that are implicit in your questions.

We looked specifically at nine high-risk groups, pregnant and lactating women, low-income children, low-income school-age children, low-income adolescents, other low-income adults, low-income nursing home residents, other low-income elderly, Native Americans on reservations, and the homeless.

We found that on the whole our efforts to assess the nutritional status of these populations were adequate for six of the groups, but inadequate for three of them—Native Americans on reservations, specifically the group you are talking about, nursing home residents, and the homeless.

So we now have the information about the indices on which our efforts are inadequate and we need to take steps to correct that.

Senator BINGAMAN. Let me come back to a question that I asked earlier. Have you made an estimate on the additional costs that would be involved in implementing this legislation? I would be interested in any figure you have.

Dr. McGinnis. I would like to submit that for the record, if I may.[1]

Senator Bingaman. Okay. We are obviously running late and we have a long list of witnesses; and, of course, Congressman Brown is here ready to testify. So we will dismiss this panel and ask Congressman Brown if he would testify. Thank you all very much. We appreciate it.

Mr. Bode. Thank you, Senator.

Senator Bingaman. Congressman Brown, you have been a champion on this issue in the House for some long period of time. We welcome you as a witness today. We appreciate your coming to testify.

TESTIMONY OF HON. GEORGE E. BROWN, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. Brown. Thank you very much, Senator, and I apologize for my own tardiness. I suffered the fate of apparently tens of thousands of other people, all of whom seemed to be parked on the 14th Street Bridge this morning, and we hope we get that situation fixed.

I have a fairly lengthy statement, Mr. Chairman, and I will ask your permission to insert the total text of that statement in the record.[2]

Senator Bingaman. We will include that whole statement in the record.

Mr. Brown. I would like to read portions of it, and then I would like to comment very briefly on some of the statements I heard after I came into the hearing this morning.

First, I do want to congratulate you on holding these hearings on S. 1081, the National Nutrition Monitoring and Related Research Act of 1987. As you have commented, some of my colleagues in the House and I have been involved in similar efforts for a number of years, and with Congressmen Buddy MacKay and Doug Walgren we were the initial sponsors of an identical bill in the House, H.R. 2151. I am very pleased to have the opportunity to present my perspectives on this legislation.

As I am sure you have heard, the issue of national nutrition monitoring has surfaced approximately every five years since 1940, usually in response to testimony regarding hunger and malnutrition in the United States.

Each time these public concerns are aroused, the President, the Executive Branch, or the Legislative Branch urgently initiates, short-term and piecemeal surveys to obtain objective data on the dietary and nutritional status of the population.

Examples of these include, in 1967, a Congressional mandate that led to the National Nutrition Survey, commonly known as the Ten-State Nutrition Survey; in 1971, a Presidential directive that resulted in a decision by the Secretary of Health, Education, and Welfare at that time to transform the National Nutrition Surveillance Survey into what is known today as the National Health and Nutrition Examination Survey, or NHANES; and in 1977, a Congressional mandate in the Food and Agriculture Act for a proposal for a comprehensive nutritional status monitoring system.

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[1] See p. 467.

[2] See p. 367.

Unfortunately, the results of each of these surveys were made available several years after the urgent situation that had prompted their mandate. Therefore, what was perceived to be an immediate public need was addressed through new policies and intervention strategies without the benefit of the surveys that were designed to guide those actions.

Although policymakers could not wait for the results of the surveys, the data could be valuable in the assessment of dietary and nutritional status over time. However, the usefulness of the data to the food and health communities and to public policymakers has proven to be limited because of inadequate methods, non-comparable standards, dissimilar population samples, and the lack of indicators to link food consumption patterns to nutrition and health.

I might interject here that you raised some of these questions with one of the witnesses, who commented that we still lack comparability and that there is a question about sample size.

The report issued last August by the departments gives a pretty good clue to that, and I quote from just one paragraph on sampling designs. It says, "Both NHANES and NFCS used stratified area probability samples of households," which normally is a good practice. "However, resolution of a number of issues related to the sampling designs—for example, differences in degree of clustering and development of compatible sampling frames—remain unfulfilled objectives of both the Department of Health and Human Services and USDA. The departments have made limited progress in these areas." That has been something they have been working on for quite a few years.

Today, the NFCS surveys, conducted by Agriculture, NHANES, and Health and Human Services, are the cornerstones of nutrition monitoring. The attention that has been given to nutrition monitoring by the Executive Branch and the Congress alike has focused almost entirely on these two surveys.

Other surveys, such as the Total Diet Study conducted by FDA and the Consumer Expenditure Survey conducted by the Bureau of Labor Statistics, have been ignored. There is little indication that all surveys are linked, that they compliment rather than duplicate each other, or that they operate in tandem as part of a strategic, continuous, or comprehensive system.

Obtaining an assessment of the Nation's nutritional health status is, of course, the ultimate goal of nutrition monitoring. While most of the attention has been placed on the administration of the surveys, the infrastructure necessary to improve the accuracy and use and cost effectiveness of the resulting data has received inadequate support.

Scientific methods and technology to assess nutritional and dietary status were declared costly, imprecise, and non-standardized at hearings in 1979 of the Subcommittee on Science, Research, and Technology which I chaired. Little has changed after almost ten years.

The Federal Government must accept the responsibility for developing the infrastructure and the science base for the support of nutrition monitoring activities undertaken at both the Federal and State level.

However, nutrition monitoring plans have either omitted dietary and biochemical methods research or identified these deficiencies, while at the same time excluding them from the list of priorities necessary for completion before conducting the next series of planned surveys.

Mr. Chairman, I am going to skip to my concluding summary remarks at this point, in the interests of time. In summary, I believe that the status quo is neither adequate—and the full statement expands on what I have already said—nor acceptable.

Prohibiting the use of any funds for nutrition monitoring or related research—until an interagency budget and comprehensive plan detailing specific agency commitments, resource requirements, and target dates has been merit-reviewed and submitted to the Congress—is not in the best interests of the public.

Assigning the major Federal responsibility for nutrition monitoring to one department would fix responsibility, eliminate coordination problems, and create a central focus. However, agricultural and health groups have not been able to reach a consensus on the appropriate department.

Thus, I believe the Congress must act now to prepare the National Nutrition Monitoring and Related Research Act of 1987 for the President's signature. As you know, a similar bill passed the House on June 26, 1986, by a vote of 305 to 85.

As a member of both the Committees on Science, Space and Technology, and on Agriculture, to which H.R. 2151 was jointly referred, I am committed to working with you in the Senate and with my colleagues in the House to ensure passage of this important legislation in the 100th Congress.

I might say, listening to the testimony of the previous witnesses, that there may be some misconceptions about the bill before us. There was a statement made about the bill locking in procedures.

Actually, this bill is intended to create the maximum amount of flexibility in establishing procedures here. It asks the administration to come up with its own plan for developing the necessary coordination here, and to provide all the flexibility that is necessary.

I cannot conceive of how one could describe this as a bill that locks in any kinds of procedures as a result of that, and I hope that the Committee will act favorably in moving this bill ahead so that we can secure its passage expeditiously.

Thank you, Mr. Chairman.

Senator BINGAMAN. Well, thank you very much, Congressman Brown. We appreciate your leadership on this in the House and we appreciate your coming over today to testify very much.

We will go on to the next panel. The panel has six members: Laurence Finberg, Patricia Swan, Janice Neville, Larry Gordon, Patricia O'Malley, and Ernst Wynder, if they would please come forward.

Let me make a couple of announcements before this panel starts testifying. Let me urge that everybody summarize their testimony. We will include all of your written statements in the record. The constraints of time are such that it would be best if you could make your primary points in a summary fashion, that way we will have some time for questions.

So let us begin with Dr. Laurence Finberg, who is professor and chairman of the Department of Pediatrics at the State University of New York Health Science Center at Brooklyn, and Chairman of the Committee on Nutrition of the American Academy of Pediatrics.

Dr. Finberg, we are glad to have you here. Go right ahead.

TESTIMONY OF LAURENCE FINBERG, M.D., CHAIRMAN, COMMITTEE ON NUTRITION, AMERICAN ACADEMY OF PEDIATRICS, BROOKLYN, NY [1]

Dr. **Finberg**. Thank you, sir. I am representing the Academy of Pediatrics as Chairman of the Committee on Nutrition, and I am happy to say that we support the National Nutrition Monitoring and Related Research Act.

I will do as you said and talk about parts of the testimony that we have submitted in written form.

We represent children, and children are the group in the population on whom nutrition has the quickest and longest lasting effect. The impact of nutrition on children will last the longest of any group in the population, and therefore it is extremely important that we have some clue as to what is happening to our Nation's children with respect to the changes that are going on in the American diet.

We are at the beginning of a high-technology revolution in food processing. A lot of new foods are being introduced into the market for specific nutritional purposes, and it is not always clear what the effects of those introductions will be. We cannot be sure that they will be utilized. We need to know if they are utilized. We need to know what side effects, both those that might be anticipated and especially those that one cannot anticipate, might occur, and we need to know it in a timely fashion.

As you start manipulating the diet of 250 million people, a lot of individuals, a lot of different genotypes in there, it is quite possible that things will happen that we never thought about in the initial planning, despite the best of intentions.

The National Institutes of Health and the American Heart Association have gone on a campaign to help to reduce coronary artery disease by dietary measures. I serve on one of the panels for the National Institutes of Health in doing this, the idea being to lower cholesterol levels in American diets.

We need monitoring, especially in the younger ages, to know the answers to several questions. One of these is, "Is the population following the advice that we give?" Secondly, what unanticipated effects, and indeed what possibly anticipated side effects, might occur? Are they happening?

We will need to know whether the plan works. In other words, having done this, does it really have an impact? And we will not know whether it worked unless we know whether it is being followed.

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[1] See p. 378 for Dr. Finberg's prepared statement.

Finally, we probably also need to know whether it matters whether it works or not because it is at least possible that we may reduce the incidence and time of onset of coronary artery disease only to find out that people's life expectancy is not increased at all, that they will die of other things. There may be things unmasked in the course of doing one thing that affect another, and that unmasking occurs in all kinds of biology and it is a very important phenomenon to watch.

I can give several examples, one from the nutritional field. As the population in the Western world moved from having large segments that were under-nourished and under-sized, and as food became available, people became taller, and had greater physical prowess.

It also turned out that we produced more obesity, that we produced some more diabetes, some more gout, possibly some earlier coronary artery disease. Those were not effects that were anticipated at the time, but they developed as we got rid of one problem.

It is probably even more dramatic to take an example from another biological field, from infectious disease. We had the scourge of bacterial infections 75 years ago. We developed all kinds of measures both to prevent and to treat, and then emerged new diseases, viral diseases not anticipated whose effects had been masked by the presence of these other diseases.

One can draw similar analogies in the field of cancer, and I could go on, but I hope that I have made the points that I wanted to make and I will be very happy to answer any questions later.

Senator BINGAMAN. Thank you very much. I think we will go through all the testimony and then ask a few questions after the entire panel has testified.

Dr. Patricia Swan is a professor in the Department of Food Science and Nutrition, and Associate Dean of the Graduate School at the University of Minnesota. She currently serves as Chair of the Joint Public Affairs Committee of the American Institute of Nutrition and the American Society of Clinical Nutrition.

We are glad to have you here, Dr. Swan.

TESTIMONY OF PATRICIA B. SWAN, Ph. D., CHAIR, JOINT PUBLIC AFFAIRS COMMITTEE, AMERICAN INSTITUTE OF NUTRITION AND AMERICAN SOCIETY FOR CLINICAL NUTRITION, MINNEAPOLIS, MN [1]

Dr. SWAN. Thank you, Senator Bingaman, for this opportunity to testify in support of the National Nutrition Monitoring and Related Research Act of 1987. My name is Patricia Swan and I have presented some written, formal testimony on behalf of the AIN and the ASCN as to our reasons for supporting this legislation.

With your permission, I would like to make about five minutes of informal comments here rather than summarizing that written testimony.

Senator BINGAMAN. That is fine.

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[1] See p. 383 for Dr. Swan's prepared statement.

Dr. SWAN. In my written testimony, I state that we do not now have a national nutrition monitoring system. You have heard representatives from the Departments of Agriculture and Health today testify regarding the national nutrition monitoring system. Why this discrepancy?

In my view, a national nutrition monitoring system requires that there be some system that takes a national overview. Separate programs do not make a system unless they are brought together or coordinated in some way.

Hence, coordination is very key to what we are talking about.

A national nutrition monitoring system also requires, as a minimum, that there be both measurements of food consumption and measurements of nutritional status; that is, clinical, biochemical, health-related measurements.

Currently, our Department of Health carries out these measures of nutrition status, but they do very little toward an understanding of food consumption. Currently, the Department of Agriculture carries out studies of food consumption, but they do very little toward an understanding of nutritional status.

Thus, at the moment neither department by itself can carry out comprehensive nutritional monitoring on a national basis. This means that coordination between these two departments, at a minimum, is essential, and I maintain that the present coordination is too limited for us to claim that we truly have a national system for nutrition monitoring.

So one could say, well, then why not put all the programs together in one department and then you will have a comprehensive national nutrition monitoring system? I would strongly oppose doing this because I believe that the natural interests of the departments are such that we can expect excellent measures of nutritional status from the health department, excellent measures of food consumption from the Department of Agriculture, but I do not think that Agriculture would do a good job measuring nutrition status and I do not think that Health would do a good job measuring food consumption.

This leaves us, then, with the necessity for coordination, and this is where the Congress can help. The Congress has a natural interest in having this effective national system on which you can then base your food policy and some aspects of your health policy.

You also need a mechanism for assuring that the results of these separate programs can somehow be brought together and provide you this overview that you need for policy formulation. This bill provides for that coordination and it gives the Congress a mechanism for receiving that overview.

Now, we all know that coordination among Federal departments, as among many other kinds of organizations, is very difficult. There are many quite natural obstacles to such coordination, and we have witnessed the power of those obstacles during the past ten years.

During these past ten years, individual programs have achieved much and you have received reports from both departments about their progress, and if you look closely at those reports you will see that it is primarily progress from individual programs, not from a coordinated system.

I would say that many of these programs individually are considerably better than they were ten years ago and I would commend them for this achievement. I am sorry to say, though, that coordination has not greatly improved during the last ten years.

The 1977 farm bill called for coordination. The proposal that was presented the next year proposed coordination. Unfortunately, an implementation plan took a few years and it was 1981 before we got that, but it also promised coordination.

We had hoped for some correspondence among the samples that were drawn for the major surveys. This has not really occurred to date. We were told that the Nationwide Food Consumption Survey and the National Health and Nutrition Examination Survey would both be in the field in 1987, and we said now is the opportunity for real coordination among these surveys.

But then a budget shortfall resulted in the subsequent decision that the health survey would be delayed, and I think it will go into the field this fall. Problems in coordination and communication between the two departments greatly limited the ability to get comparable questions on the questionnaires for the two surveys. Agreement was not reached on many aspects of sample definition.

We were told last year that there was going to be interagency coordination through a subcommittee of the Interagency Committee on Nutrition Research. This year now, in current testimony today, we are told there is going to be an interagency committee on nutrition monitoring itself, and that it will probably be working by the summer.

These delays and these shortfalls in accomplishing objectives attest to the difficulty in overcoming these natural barriers to coordination. The people who run the programs tell us that they would like to coordinate their efforts, but we notice that the coordination does not take priority over many other departmental interests.

I do not say that coordination among the programs should always have priority over all other objectives, but we need a better balance, and a balance that is more in favor of coordination.

The Congress can help provide that balance. I think you can help the departments achieve their coordination goals that they themselves have stated through passing this legislation.

Finally, just a brief comment about the research components of the legislation. As you know, the business of better methodology is a concern of the scientific community. There was a workshop involving several representatives of scientific and professional societies held last fall and a report providing a comprehensive summary of research needs to improve methodology was written.

I believe that representatives of the Institute of Food Technology have provided your Committee with a copy of that report, and I commend it to you.

Thank you.

Senator BINGAMAN. Well, thank you very much for that excellent summary.

Before we go on to the other four witnesses here, let me just ask Senator Levin whether he wishes to make a statement before we proceed?

Senator LEVIN. I will pick up later.

Senator BINGAMAN. Okay.

Our next witness is Dr. Janice Neville, who is a professor in the Department of Nutrition at Case Western Reserve University in Cleveland, Ohio. She is currently serving as President of the American Dietetic Association, which has been one of the organizations pushing most strongly for this legislation.

We are glad to have you here. Please go ahead.

TESTIMONY OF JANICE N. NEVILLE, D.SC., PRESIDENT, AMERICAN DIETETIC ASSOCIATION, CHICAGO, IL [1]

Dr. NEVILLE. Thank you very much, Mr. Bingaman. On behalf of the 57,000 members of the American Dietetic Association, I would like to thank you for giving us this opportunity to address you today.

We support the National Nutrition Monitoring and Related Research Act of 1987. The American Dietetic Association promotes optimal health and nutritional status of the population through the provision of direction and leadership for quality dietetic practice, education, and research.

The American Dietetic Association supports the goals of a national nutrition monitoring system. The system is structured to meet the expanding needs of food, nutrition, and health professionals, and State and local governments. These are expanding and do need to be addressed. It will provide the basis on which agriculture, dietary, nutrition, and health policy are determined. We will then have essential information for the development and implementation of the Year 2000 Health Objectives for the Nation and the Dietary Guidelines for Americans. In addition to our Association, there are more than 35 groups in the Coalition for Nutrition Monitoring supporting this bill. A list of these groups is provided in our written statement.

Representative Buddy MacKay has said that the lack of a national nutrition monitoring system is frustrating, and this is an issue that should not be so troubling.

At the March 1st hearing on nutrition monitoring, it became clear that there is great need for nutrition research data. This emphasizes the need for a comprehensive study of the nutritional status across the country. It reinforces the need for stronger planning and coordination of nutrition monitoring activities.

Members of the American Dietetic Association integrate and translate food and nutrition science into dietary guidance and food choices for the public. As dietitians, we know it is necessary: to determine the nutritional status of an individual or a group; to find out what the situation truly is, in order to make recommendations for change that will solve the problems. It is just as important to have a comprehensive picture of the nutritional status of the entire American population. Only in this way can programs meant to help people be designed to provide real solutions to national problems. Members of our Association are very much interested in having comprehensive, timely data from a national nutrition monitoring system because they constantly use the data for research, education and food service.

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[1] See p. 388 for Dr. Neville's prepared statement.

Since 1936, the Federal Government and others have been working with nutrition monitoring systems. Food consumption and national survey data collected to date have been useful. However, the time has come to move on and to take advantage of new technology and new methodologies.

We have addressed the status of current nutritional monitoring activities in our written statement and it is summarized in Table 1 of that statement. Although the agencies have made a great deal of progress, there is room for improvement.

The cost of this bill will depend on the priorities selected by the agencies in any fiscal year. However, the bill clearly states that nothing in the Act is intended to authorize the expenditure of funds in excess of what would be expended in the absence of the coordinated program. Moreover, improved coordination and accountability of monitoring efforts should make much more effective use of the Federal expenditures. The improved health that would result from this program would save money both in the government and in the private sector. However, to date, we do not have complete information on what the Federal Government spends in nutrition monitoring activities. This is why we need line items in each agency's budget.

The current monitoring system falls short in providing information on high-risk groups—hungry, homeless, elderly, pregnant women, and children. The USDA and HHS operational plan, which does show some improvement, also shows major gaps. Nutritional status data on hungry and homeless persons is conspicuously absent in the current system, and this was pointed out a little earlier this morning as well. Users need information on all segments of the population.

The legislation requires the Secretaries of USDA and HHS to coordinate scientific research necessary to support a national nutrition monitoring system. Every day we hear about technological innovation in the space program, medicine, biotechnology, and environmental science. With such technologies, surely there are better methods available to determine dietary intake and nutritional status.

As stated at the March 1st hearing, there is a continuing consensus among scientific experts, and it has been confirmed this morning, that more funds are needed to be appropriated for basic nutrition research—including nutrition monitoring.

The Association also supports the formation of the Nutrition Monitoring Advisory Council. The agencies need to make better use of the knowledge and the abilities of scientific and other user experts beyond the Federal Government. The Advisory Council will provide an objective perspective on the system that is not currently available. User input would be particularly helpful. The American Dietetic Association stands ready to help.

The Association supports Title III on dietary guidance. Consumer demand is one factor that drives food production. Consumer demand for nutrition information should also drive nutrition surveys to release information that is timely, useful, and understandable by users and other parties. Federal dietary guidance should be based on timely data.

In summary, national nutrition monitoring legislation would mandate for the first time a coordinated interagency and intergovernmental system. The system is structured to meet the expanding needs of Federal and public entities for health, nutrition, and dietary information.

Enactment of this legislation will maximize and strengthen the benefits of existing Federal nutrition monitoring activities. Comprehensive data on nutritional status will help us determine where we are. It will pinpoint the problem areas and make it possible for us to direct our efforts and our resources towards those populations most in need. In the absence of data, development of programs and assignment of resources is based on suppositions and generalizations. This legislation would make it possible to stop guessing. We would have an ongoing mechanism for identifying populations at risk on a timely basis. We could identify problems early when they are easier to solve.

At the same time, the legislation will increase our ability to provide appropriate programs for food assistance, diet and health promotion/disease prevention, food safety, and nutrition education.

We thank the Committee for the opportunity to express the views of the American Dietetic Association on this bill. The Act takes the resources that are currently used for nutrition monitoring and directs that they be used in a coordinated and a cost-effective manner to improve the public health. It is imperative that this bill be promptly reported out of Committee and enacted into law this year.

Senator BINGAMAN. Thank you very much.

Our next witness is Mr. Larry Gordon, who is the Secretary of the New Mexico Health and Environment Department. Mr. Gordon is testifying today as a representative of the Association of State and Territorial Public Health Nutrition Directors, and we appreciate your being here very much.

TESTIMONY OF LARRY J. GORDON, SECRETARY, NEW MEXICO HEALTH AND ENVIRONMENTAL DEPARTMENT, REPRESENTING THE ASSOCIATION OF STATE AND TERRITORIAL PUBLIC HEALTH NUTRITION DIRECTORS, ALBUQUERQUE, NM[1]

Mr. GORDON. Thank you very much, Senator Bingaman, and good morning. On behalf of the Association of State and Territorial Public Health Nutrition Directors, which, as you know, is an organization of nutrition professionals representing the health agencies of the 56 States, territories, districts and commonwealths, I thank you for the opportunity to speak in support of legislation that will for the first time provide this country with a coordinated, integrated, and timely system for nutrition monitoring.

I learned long ago in my career that equals cannot coordinate equals and someone needs to be placed in charge if we are to do this job right. The need for national nutrition monitoring legislation has only intensified in the four years since we first testified in favor of a bill in the House of Representatives, a bill very similar to the one before you today, Mr. Chairman.

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[1] See p. 400 for Mr. Gordon's prepared statement.

We in the States have an increased responsibility for planning programs and services to meet the needs of our citizens and very little information on which to base these decisions.

There has been a steady increase in the competition for limited State and Federal resources and a need to allocate these resources in an equitable manner. Timely, complete, and reliable data are essential to our task of developing policies and programs to meet the changing health needs of our citizens.

Over the past several years, we have been faced with making decisions about the magnitude and severity of nutritional problems within our jurisdictions without good nutritional data on which to base decisions.

Massachusetts, New York and Texas, I am told, have been able to conduct limited State nutrition surveys to determine specific nutrition problems and have used the data to secure State funding to expand their WIC programs. With limited resources, most States cannot undertake comprehensive surveys and must continue to rely on the Federal Government for leadership in the collection and interpretation of nutritional status data. We need reliable, standardized data that are readily accessible to the States.

The core of the current national nutrition monitoring system consists, as you know, of the National Health and Nutrition Examination Survey, which is being called HANES, and the National Food Consumption Survey, with, depending on how is one counting, up to 30 other data sources.

The majority of these data sets exist independently of one another. Within this mountain of data, there are certainly some overlaps and some gaps, many inconsistencies, and virtually no way to put any combination together to get a complete picture of the dietary habits and nutritional status of the American public.

We in the States need a system that coordinates the studies so that the results can be used to portray an accurate picture of our citizens and identify those with problems who are in need of services. With such data, we can develop programs that target specific problems.

We need more specific information about groups who are most vulnerable to nutrition problems. The current sampling method used for most of these studies results in under-sampling those most likely to have nutrition problems, and this has been stated before, Mr. Chairman, this morning—the very young, the elderly, the poor, especially the homeless, and certain minority groups.

In our own State of New Mexico, the under-sampling of vulnerable groups is a particular problem, and this is undoubtedly true in other States, too, because none of the States are alike demographically.

We have a population mix unlike any other State, with something like 36 percent Hispanic, mostly from old Spanish families which have been in our State for centuries, some 8 percent American natives, 53 percent Anglo, and 2 percent black. This makes our State distinctly different from others.

Of our 1.5 million population, 50 percent of our children under age five have family incomes below 175 percent of poverty. We have a young population, but a rapidly increasing elderly population. The HANES data do not fit New Mexico populations. Using national data averages, it is too easy to assume that under-nutrition is not a problem.

While we recognize the importance of establishing norms, we must also advocate for a system that documents nutritional problems in our country so that we can target resources appropriately. We applaud the inclusion in this legislation of the requirement to develop a plan for the continuous monitoring of these high-risk groups.

I cannot overstate the importance of timely information. We are now writing objectives for the year 2000 and HANES III has not even started. Once more, we are writing objectives with an inadequate data base. The same things occurs when we try to set goals at the State level and, as I am sure you understand, it is difficult to convince legislators that they should fund programs to meet needs that we cannot accurately describe.

Too often, Mr. Chairman, we have seen large, expensive, sometimes ineffective programs designed without fully understanding what the problem is when we design the program. We must know trends in nutritional status and dietary habits. The population of the United States represents the proverbial moving target. There is a critical need for new, cost effective methods for monitoring trends in food consumption and nutritional status.

There has been little work by either Health and Human Services or USDA to develop shorter, cheaper methods that we can then use in our States to supplement the national studies.

Perhaps the greatest need in the States is for technical assistance, the sharing of the knowledge and expertise of those who work on these Federal projects with our staffs. At the Federal level, there are the resources to develop new methods and equipment and to teach us new ways of looking at our work.

The demand for statistical support is great and the resources are limited. Few of our States can afford the luxury of statisticians who are expert in very specific fields such as nutrition.

Finally, as users of nutrition data, we need to participate in the planning of the various studies and surveys. We should like to have the opportunity to pose the questions that we believe need to be answered in order to plan effective programs.

We would like to participate in the setting of priorities and making of decisions about how surveys are conducted, the type of data to be gathered, and, most critically, how that information will be distributed.

We especially appreciate the inclusion of the National Nutrition Monitoring Advisory Council in this legislation. It provides for the first time formal opportunity for users of nutrition monitoring data to provide input and guidance to the Federal agencies about their needs.

In summary, Mr. Chairman, the discussion of the need for nutrition monitoring begun in the early 1970s has been discussed in both Houses of Congress almost every year since. The time for purposeful action is now in this session.

The American public is concerned both about nutrition problems that affect the Nation's health and about limited resources available to intervene to counter those problems. Federal, State and local health agencies need timely information to make decisions, develop programs, and develop budgets.

To date, the mechanisms designed to meet these needs have not produced the desired results. Nothing less than the passage of the National Nutrition Monitoring and Related Research Act in 1988 will provide the national structure needed to achieve optimal nutritional health from our investment.

Thank you, Mr. Chairman.

Senator **Bingaman**. Thank you very much, Larry.

Before we go on to our next witness, Senator Levin is going to have to leave for another appointment, so why do we not allow him to make a statement here or ask questions if he has some.

Go right ahead.

OPENING STATEMENT OF SENATOR LEVIN

Senator **Levin**. Thank you, Mr. Chairman. I have just a very brief statement. First, let me commend you for calling this hearing and for your initiative in this area, which is very, very significant for all of us.

The testimony of the panels this morning is important, and we will review it. I had hoped to be here for the panels but, as you indicated, cannot. But I would like to say one word about a later witness, Ernst Wynder.

Dr. Wynder is a friend of mine, so if I could just get in one personal word about him before I have to leave, since I will not be here to add to your introduction.

Dr. Wynder is a pioneer in many areas of preventive health education. The month that he graduated from medical school, he published an article in the American Medical Association Journal linking smoking with cancer. It was a pioneer article; it led to a lot of public interest and, finally, action in this area.

In 1969, I believe, he formed the American Health Foundation, of which he is now president. The Foundation has a staff of over 200 people who are involved in trying to assist all of us in the United States to act against some of the leading causes of death, such as heart disease, cancer, and other illnesses.

He and his Foundation have published something called the Health Passport, which urges each of us to make an annual health record of various factors which go into our health, and which gives scores for things like cholesterol, cigarette smoking, weight, and age, and shows the relationship between them and our overall health.

I would commend this Passport to the members of this Committee and ask that this be made a part of our record because I think it is a significant contribution to the preventative health educational process.[1]

Again, Mr. Chairman, thank you for letting me intrude at this moment in the hearing to say a word or two about your efforts and, in particular, about Dr. Wynder.

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[1] See p. 557.

Senator BINGAMAN. We will certainly include that in the record, and we appreciate your interest in this issue.

I think we will hear from Patricia O'Malley and then go right to Dr. Wynder for his testimony. Patricia O'Malley is the Food Program Advocate for Hunger Services Network in Pittsburgh.

Hunger Services Network is a private, non-profit collection of organizations and individuals concerned about the causes and effects of hunger. So we are very glad to have you here and we look forward to your testimony.

TESTIMONY OF PATRICIA A. O'MALLEY, FOOD PROGRAM ADVOCATE, HUNGER SERVICES NETWORK, PITTSBURGH, PA [1]

Ms. O'MALLEY. Thank you. Good morning, gentlemen. I sincerely thank you all for the opportunity to speak to you today, and although I wish that a hearing on a topic related to hunger was not necessary, it is a pleasure to be here.

The Nutrition Monitoring and Related Research Act is, in the long run, the most important piece of anti-hunger legislation to come before Congress in many years. Among other things, it will establish a system to count the number of hungry people in the United States on a regular basis. This data will provide anti-hunger advocates with much needed evidence to support our work for improvements in Federal food assistance programs.

The information obtained from the monitoring will also provide a basis for establishing a comprehensive Federal anti-hunger policy. At the moment, there is no such policy. There have been many studies documenting the extent of hunger in the past eight years. Most have been conducted by private organizations or local governments.

The findings of the studies overwhelmingly agreed that hunger is present and growing, and the benefits of Federal programs have not kept pace with inflation. In fact, drastic cuts in food assistance programs have directly harmed millions of Americans.

It is difficult to expound on the previous statement without quoting every study and statistic at our disposal. That alone is evidence of the extent of hunger in America. However, we believe that the proliferation of agencies responding to the hunger crisis and the increased demand for the services offered by those agencies speak for themselves.

Our experience with our clients is representative of national statistics. Sixty-four percent of our emergency food assistance clients already receive food stamps, but still need our help to feed their families. Fifteen percent of our clients have no income whatsoever. Most of our clients' food stamps are gone by the third week of each month.

In August 1983, President Reagan claimed to be perplexed by reports of hunger in the United States. After the public outrage caused when then adviser Edwin Meese claimed that people only go to soup kitchens because the food is free, the President appointed a task force on food assistance.

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[1] See p. 406 for Ms. O'Malley's prepared statement.

In its report the task force recommended that the Federal Government take several steps designed to improve information on the nutritional status of Americans. The administration has yet to follow the advice of its own task force.

While life is much too complicated to allow anyone to become an expert on every subject, most people are well-versed on at least one topic. Anti-hunger advocates work with hunger, poverty, and inadequate Federal programs every day. Many of us have spent years studying regulations, helping clients through the bureaucratic mazes, and packing bag after bag of groceries.

Some of us have been or still are poor and hungry. However, when speaking of those issues, we are routinely disputed, avoided, and ignored. Some people just do not want to know the truth.

Hunger Services Network maintains a speakers bureau to educate the public about the causes and effects of, and to solutions to hunger. The most frequently asked questions are, how many people in the United States are hungry, who are they, where are they, and why are they hungry. A nutrition monitoring system will answer these questions.

While the private and local studies which exist are accurate and reliable, they are relatively minor and sporadic. Only a comprehensive system can provide the data that we need.

Title I of S. 1081 provides for the use of the nutrition monitoring data as a base for establishing a national food and hunger policy. At present, the United States has no such policy.

In September 1976, both Houses of Congress adopted a right to food resolution. Included in that resolution was the statement, "In the United States we should seek to improve food assistance programs for all those who are in need to ensure that all eligible recipients have the opportunity to receive a nutritionally-adequate diet." After more than eleven years, the United States has yet to establish a method of determining how many Americans are in need to fulfill the conditions of that resolution.

During the past 20 years, the United States has been following a hit-or-miss practice of providing for its hungry. That practice has failed. The United States used food assistance programs as its traditional means of dealing with hunger.

While millions of Americans have benefited immensely, those programs are still grossly inadequate because of the lack of a national anti-hunger policy. The Nutrition Monitoring and Related Research Act will serve as a prelude to an efficient, consistent, and comprehensive policy. With such hard data at hand, policymakers would be hard-pressed to avoid the issue.

A careful reading of the history of food program legislation during the past 50 years shows an ebb and flow of concern about the problem and commitment to finding solutions. While that is all very interesting politically and historically, it is personally devastating to those who must suffer because of such instability.

Hunger in the United States is certainly not the result of a lack of food. It is the result of poverty. Therefore, it is particularly important to concentrate on gathering data on low-income populations and those who are especially vulnerable in the monitoring surveys.

Through the upsurge of hunger in the 1980s, we have struggled to provide our clients with a sufficient quantity of food. When distributing food, we do our best to provide good quality and a nutritionally-balanced package of groceries. We often fail.

Of the 128,658 people we have served since 1979, we have no doubt that many of them are existing on nutritionally-inadequate diets, even though we may have temporarily succeeded in alleviating their hunger pains. Even those who are not hungry by the common definition are often at nutritional risk.

Since we are not qualified to comment on the technical and scientific aspects of the bill, we will leave that to those who are. We ask you to respect their expertise.

The hardest part of my job is telling desperate, needy people that they do not qualify for the food stamp program because of the restrictive eligibility requirements. I tell them that I personally disagree with many of the regulations, but that the rules are made by Congress and must be followed. Then I suggest that they write to their representatives if they want to see those rules changed.

It is incredible that any nation would refuse to find out how many of its citizens are suffering from hunger and malnutrition so that plans may be made to alleviate that suffering. This is your opportunity to correct a serious deficiency in national domestic policy. Hunger and poverty have taken a back seat for much too long. These issues should be a national priority.

Please ask yourselves what will be the cost of not making them a priority now.

Nutrition monitoring bills passed the House of Representatives in the 98th and 99th Congresses. The Senate has yet to approve such a bill. I hope the Committee will send S. 1081 to the full Senate with its recommendation for approval. Otherwise, perhaps the members of the Committee can tell my clients that they cannot get help because those in power do not believe that their problem is real.

Thank you again for your time and I hope to hear good news soon.

Senator BINGAMAN. Thank you very much for that testimony.

Our final witness on this panel is Dr. Ernst Wynder. I want to underline all that Senator Levin said. Dr. Wynder is also a good friend of mine and has been a pioneer of many of these issues in the country.

Dr. Wynder is the president of the American Health Foundation, which is an organization involved both in basic and applied nutrition research. We are very glad to have you here today, Dr. Wynder.

TESTIMONY OF ERNST L. WYNDER, M.D., PRESIDENT, AMERICAN HEALTH FOUNDATION, NEW YORK, NY[1]

Dr. WYNDER. Thank you, Senator Bingaman. I appreciate Senator Levin's kind remarks.

As a physician, I am often asked what is my fundamental goal, why did I study medicine. I, like you, Dr. Finberg, believe that the true art of medicine is prevention, not cure. I think we would all agree with that, so what is our problem?

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[1] See p. 433 for Dr. Wynder's prepared statement.

Our problem is that we as individuals regard prevention with somewhat of an apathy because we suffer from the illusion of immortality. We as doctors normally look at preventive medicine with benign neglect and then, of course, we have the problem of active opposition from certain industries.

My goal in medicine follows some Greek proverb which says it should be the function of medicine to help people die young as late in life as possible. We can do that. Our death rate to a large extent is determined by what we eat, smoke and drink.

To the extent that your bill deals with national nutrition monitoring and related research programs, it is a step in the right direction and we support it. But while I have heard a good deal about monitoring so far in your discussions this morning, I have heard less about implementation and evaluation.

Now, you have at the end of your bill a statement about dietary guidelines by the year 1990, and I think this is a very important part of the bill. What are the guidelines for us as individuals? What are the guidelines for us as health professionals? What are the guidelines for the food industry?

Clearly, the end point of monitoring is not more data. The end point of monitoring is that this country will no longer suffer from malnutrition of the poor and malnutrition of the affluent.

Clearly, nutrition, as you heard on March 1 from my colleague, LaRosa, speaking for the National Heart and Blood Institute, and Peter Greenwald, speaking for the National Cancer Institute–we know that nutrition importantly affects the morbidity and mortality from various types of chronic diseases.

Not only do we die unnecessarily, but we die at enormous cost to our society, which would total $1 billion by the end of this century. I am always amused when somebody talks about how much will prevention cost. I never hear anybody in this country talk about how much we spent last year for coronary bypasses, over 200,000 of them, at a cost of billions of dollars.

Most of us are not aware that coronary artery disease is a disease of modern civilization, first described in this country in 1912. As long ago as 30 years ago when I did a study in Japan, it took me three years to find 75 bonafide cases in Japan, and even today it is not among the ten leading causes of death in China.

Now, as far as a couple of specific examples are concerned in terms of implementation–and I would like to stress this because monitoring must lead to implementation. Dr. McGinnis told us that 57 percent of our population has cholesterol levels over 200 milligram percent, and 25 percent are obese.

Now, I do not want to sit here ten years from now with the same statistics unless we have done something. And may I add to that that 30 percent of our children age 12 have cholesterol levels over 180 milligrams percent, so we know that these children are guaranteed to suffer from the same coronary disease mortality from which we suffer today.

Now, specifically, we at the American Health Foundation, in terms of implementation, have recently screened some 200,000 people around this country for cholesterol and, as Senator Levin said, we gave all these participants a Health Passport, which on the back of it says "Nobody takes better care of you than you." This is the kind of slogan that we like to make to this Nation.

The administration always tells us that we are responsible to a large extent for ourselves. I happen to agree. To a large extent, we are responsible for our health, and by knowing what our risk factors are, we can do better for ourselves in terms of what we eat, what we smoke, and what we drink.

Another implementation relates to our Know Your Body School Health Education Program, the same idea, a health passport for six-year-olds. You say, well, a six-year-old may become a hypochondriac if you tell him about cholesterol and obesity.

I can tell you, having tested thousands of children, these children enjoy learning about their own bodies, and as I said earlier, we have found that 30 percent of our children already have high cholesterol and if you add to this obesity and early smoking and all other risk factors, we know how important health education is for our children.

I would certainly suggest that any program in nutrition education must come early in life, and I would like to compliment you, Senator Bingaman, for introducing a bill that suggests that a comprehensive school health education office should be set up in the Department of Education.

Another point of nutritional interest relates to some controversies that arise. For instance, in his testimony on March 1, Dr. LaRosa indicated that mono-unsaturated oils might be a benefit for the reduction of coronary artery disease.

In cancer, we are finding that mono-unsaturated oils do not increase the rate of breast and colon cancer in experimental animals. This is a key idea. The public is entitled to know why is it that southern Italians have 50 percent less coronary disease, breast and colon and prostate cancer than the northern Italians.

He has, again, an idea from research that, if properly coordinated by this type of Committee, could lead to a proper solution of this important question.

A final point in terms of research, you were told on March 1 that alcohol might relate to the rate of breast cancer. The CDC yesterday reported it did not. We will report in the next two weeks also that social drinking does not increase the rate of breast cancer.

So there are a lot of new ideas that come up all the time, and I believe a coordinated nutrition monitoring group, as you suggest, would be very helpful to the public at large in this area.

So, in summary, then, I think that this bill—and may I add, and this has not been referred to either, your idea of a National Nutrition Monitoring Advisory Council—I strongly believe that the private sector can, in this and in all other areas, make important contributions to what the Government is doing.

If you bring in the key kind of people that you suggest, I think nutrition monitoring, nutrition implementation, and nutrition evaluation will be very much advanced.

Now, let me leave you with this final thought. I always feel that the greatest gift we can give to ourselves, to our children, and to us as a Nation is the gift of health, and what we do or do not do in nutrition monitoring, nutrition implementation, and nutrition evaluation will to a large extent determine whether this gift can be reached in our lifetime.

Senator **Bingaman**. Thank you very much. We appreciate that testimony.

I will ask just a few questions and then Senator Roth, I am sure, will have some. The testimony from the first panel was that we have a study of child nutrition that was done in 1985-1986 where 700 children were tested on food intake.

I am not an expert in surveys, but my view would be that in a Nation this size a study of 700 is not an adequate statistical basis for us to make useful decisions about nutrition or policy decisions about nutrition with regard to our children.

Dr. Finberg, you testified some on this, and Dr. Swan and Dr. Wynder. If any of you have ideas about the adequacy of the data base that we have today child nutrition, I would be interested in hearing it.

Dr. **Finberg**. I think that it is likely the sample was chosen in such a way that you get an insight into average data. The trouble is that average does not tell you the whole story. There are many sub-populations that will get missed in a sample that small with a country as diverse and spread out and with many different groups in it as ours has.

Dr. **Swan**. Moreover, Senator, in addition to reservations about the size of the sample, it is, after all, a study of food consumption and tells us nothing about the nutritional status of those children.

You are asking about nutrition monitoring for children. I have heard the Department of Agriculture refer to that as nutrition monitoring, but I would take exception to that reference because they have not collected information about the nutritional status of the children.

Senator **Bingaman**. Now, to your knowledge, is there any base of data about the nutritional status of children, either the zero to five age group or school-age children?

Dr. **Swan**. It is my understanding, and there are perhaps others here that know better than I, that there is ongoing surveillance-type surveys that are done through the Centers for Disease Control of pediatric populations in several of our States, not all of our States.

It would seem to me that there would be some opportunity here for coordination between that surveillance activity in the Department of Health and the food consumption measurement in the Department of Agriculture. But, to date, I have seen no evidence of such coordination.

Senator **Bingaman**. Dr. Wynder?

Dr. **Wynder**. Well, the key problem in nutritional surveys is the extent to which nutritional histories can be believed. I recall years ago the National Heart and Blood Institute did a survey on diet and tried to correlate it to serum cholesterol levels and no correlation was found.

I think it is important for us to recognize that nutritional histories are notoriously poor, not only in terms of bias, not only in terms of what people can recollect, not only in terms of portion size, not only in terms that we hardly ever know how foods are processed.

For all of these reasons, we believe that for nutritional monitoring we need to bring in the bio-markers, like the cholesterol level for fat intake, the weight for total calories, blood pressure, and other variables.

We have attempted to write the histories in our children and it is extremely difficult in that few children or parents know exactly what people eat, and a particular problem in this regard is the high intake of snack foods.

In our children, 25 to 30 percent of calories come in snack foods, and hardly anybody admits to how many cookies you have eaten yesterday. So there is a bias. We know the first time, those of us who practice medicine, from our clinical work when an obese patient comes in and we work very hard for the next two weeks to get the diet down and we say, Mary, Mary, how could you possibly do that, and she replies, Doctor, I do not know; I did not eat a thing. So we have got to be very conscious about the value of nutritional histories by themselves.

Senator BINGAMAN. Yes, Dr. Finberg.

Dr. FINBERG. There are some nutritional monitoring data on children, but they tend to be about ten years old and so they are not timely and therefore are not completely useful. The CDC does do some projects, but they are ad hoc projects. They are not continued monitoring, and therefore they stop existing after each project is completed.

Senator BINGAMAN. Larry Gordon, you indicated in your statement that the States rely upon the data collected by the Federal Government, and that they have to because of budgetary restrictions. You pointed out some of the sub-groups in our State that, at least in the view of some, may have some peculiar nutritional issues to deal with, for example, the large Hispanic population and the native American population.

Do you receive from the Federal Government, from any of the agencies that are involved in this at the Federal level, information that helps you as a State administrator to make policy with regard to those sub-groups?

Mr. GORDON. The information we receive, Mr. Chairman, might be more useful for some of our relatively nationally normal type urban populations, say, in an urban area like Albuquerque. For our types of populations, our native Americans and our northern New Mexico Hispanics, they are far different from anything that we would find in other States.

Even within our own State, some of the cultural patterns and dietary habits of the native Americans are much different among different tribes. I hear statements about national information relating to Hispanics. Certainly, they are far different for the Hispanics in an urban area of New York or Washington, D.C., than they are in northern New Mexico where people have been settled there in a rural area for centuries.

Senator BINGAMAN. Dr. Neville, you testified, as I understand it, that in the view of your Association, the Act that is being considered here would actually result in a savings rather than an additional cost, or certainly would not involve additional cost.

Maybe you could elaborate on that, because that is contrary to the information some of the members of the first panel gave us.

Dr. **Neville**. Well, I think it is always difficult when you are deeply involved in something to step back and take a look to see that indeed you can save money when we all know that we would like more people and more bodies to do the work.

However, if we had good data on what our total efforts were in terms of nutrition monitoring even within the Federal Government, which we do not have now—in other words, they are not well coordinated now—it would be much more possible to make a plan that was making use of all of the resources so that there would not be duplication, but a much greater and comprehensive effort.

I think that is the major problem. We have some things that are being duplicated over and over again, other things that are being missed completely. Most of us that have been involved in research or in work with populations know that if you stop and take the time to look at what you are doing and to plan that you indeed make a better use of resources. The potential here is great for this.

Senator **Bingaman**. Patricia O'Malley, you said that under the present arrangements that we have, all the different agencies doing different pieces of this job, we are not able, at least from your point of view, to accumulate accurate data on the extent of hunger in the country.

Why can that not be done without this change of structure? Why cannot one of the agencies be directed to do that, or why can it not be accomplished under the present set-up?

Ms. **O'Malley**. I think it probably could be, but I do not think it will. I do not think there is an interest in the administration at the moment to make the effort to do that, and I think when the legislation passes it would be required and it would not be subject to whoever happens to be in the White House at the moment or whoever happens to be secretary of whatever department.

Senator **Bingaman**. Senator Roth, did you have some questions of the panel?

Senator **Roth**. Yes, thank you, Mr. Chairman.

In the testimony, some mention was made of duplication. I wonder, is there some way we can set priorities for nutritional monitoring. I am not enough of an expert, but obviously the problem of the poor and children is essential. We have an aging population, which must raise some serious problems with the elderly's diet, such as for those in nursing homes.

Should we try to set any kind of priority as to where the emphasis should be, Dr. Neville?

Dr. **Neville**. At this point, one of the things that is very exciting about this legislation is the comprehensive planning because most of the studies that have been done have been based on an assumption that we have certain high-risk groups, and so we plan the study to confirm the impression that we have.

That is a reactive sort of situation and had led to the kinds of things that have been referred to here this morning in terms of doing program planning on what we guess the problem will be.

The exciting component of this legislation is it does indeed not only address the issue of those groups that we know in the past have been the most vulnerable, but presents an opportunity for us now to get a handle on the changes.

We have a changing population and we have——

Senator **Roth**. We have—I am sorry; I could not hear that.

Dr. **Neville**. I said we have a changing population.

Senator **Roth**. Yes.

Dr. **Neville**. We are living longer, so the whole idea of who is vulnerable or what age constitutes being elderly is changing. We do not at this point have the kind of data that we need to deal with these groups, as well as with the very young. This is one of the exciting components of this bill.

I would also say that in terms of coordination of nutritional monitoring, we need to have food intake data coordinated with nutritional status research. I mean, we need to know what the population is consuming as well as the biochemical data on this population, and that is one instance where coordination right away could be very helpful.

Senator **Roth**. You make the point that we live longer, and I like that. [Laughter.]

But let me, Dr. Wynder, go back to a comment you made, and I agree with what you said, too, about the problems with the money we spend on heart diseases, and so forth.

Why are people living longer? I guess that is my question. There certainly has been a sizable improvement in the length of life. Was it not Time Magazine that recently had an article that 65-year-olds are leading full lives?

I do not want this to be taken as if I am not fully supportive, but maybe we ought to look at what we are doing right, too. I wonder if that is an aspect of nutritional monitoring.

Dr. **Wynder**. Well, the first thing we are doing right is we have given up smoking.

Senator **Roth**. Yet, we still have a lot of people smoking.

Dr. **Wynder**. When I first began, it was close to 60 percent. It is now some 30 percent of populations in adults, and this is a step in the right direction. Secondly, we have developed today that we did not have years ago all kinds of antibiotics.

It used to be said that bronchial pneumonia was the old man's best friend. Now, we cure bronchial pneumonia and we die at a later age, and the biggest difference in terms of life span, of course, is the fact that we have significantly reduced infant mortality during this century. So, clearly, there has been some progress.

But I suggest to you, because both you and I are very much interested in dying late in life young, that we are not meant to die of disease. I firmly believe that we are only meant to die when the genetic time clock has run its course, and this depends to a very large extent on what we eat.

May I say, when we talk about eating—and I have not heard this mentioned today—we are also talking about physical activity. After all, we get obese both because we eat too much and because we do not spend enough calories, and I think we have become somewhat more energetic as a society in terms of leisure time activity.

This all pulls together, but it does not mean that we still cannot do better, and I again would like to emphasize that what we are doing here is not only medically right, but it is fiscally important. Sometimes I feel our country will only listen to us when we talk in economic rather than only medical terms.

Senator ROTH. Well, I would like to raise a question about implementation. Is that primarily a matter of education? Let us return to smoking. We required, of course, that advertisements contain a statement pointing out the health risks. Yet, do we not sell as many cigarettes now as we always did? Maybe fewer are smoking more.

But how do we get this information out where it is useful to the public at large?

Dr. WYNDER. Well, if you would make me health czar of this Nation, I would say you have got to do actually what industry does. You have got to take a certain amount of money and see where your best markets are.

First of all, I think your best market is our children. I think nutrition education in schools is vital, not only for what children will learn about nutrition, but I think nutrition education is a good entry point to health education in general.

Secondly, we have got to do a better job in educating doctors and make sure there is a good deal of incentive for them to do preventive medicine rather than just curative medicine, and this may bring in the insurance industry which might give us some incentive to pay for prevention rather than only for cure.

Thirdly, we have got to bring in the media. The media has played a very important role in the attitudes of our public on smoking. The media has played a very important role on obesity in women, so we want to bring in the media.

Finally, we must bring in responsible industry. We must have industry relate to our messages here and produce more products that are more healthful to our society. You know, you give industry the proper challenge and American industry can play a very important role.

Senator ROTH. Dr. Neville, do you have any comments?

Dr. NEVILLE. I certainly would reinforce what he is saying, and I think the important thing about nutrition monitoring, per se, is it does help us pinpoint those areas where we should focus education, which is one of the reasons why I think it is so very important.

We have had some wonderful efforts at sending messages, and they were messages that were not needed; they did not address the problem. As important as implementation is, I think an essential first step is to clearly define what the problem is so that we get the right solution for the problem.

Senator ROTH. Mr. Chairman, I just have one or two more questions.

There has, of course, been some criticism in the past that occasionally government comes out saying a particular food is not healthy and then later on evidence reverses those decisions.

I guess part of my problem is that everything I like is not healthy for me, but how do we prevent information from coming out that scares people that may not be adequately documented? Is that a real problem, do you think?

Dr. FINBERG. Well, one of the ways is to have a very good data base so that you have accurate information on which you can first draw hypotheses, test them, and then be accurate about them so that you are less apt to make a mistake and destroy your credibility by recommending something prematurely.

Dr. WYNDER. I would concur with that. We, as a medical and scientific profession, have sometimes been in error, perhaps, in our rush for publication. You in the Congress have sometimes also been in a rush. Just to remind you of the Delaney Clause, I think that, of course, was more a problem than it was worth.

Senator ROTH. I find it very hard to understand that Congress erred. [Laughter.]

Dr. WYNDER. I just wanted you to know that not all the problems come from this side. But the advisory council that you envision, I think, if properly structured, could play an important role here.

Dr. SWAN. Senator Roth, if I just might add, the question of considering the total diet is always an important focus in considering the relationship of diet to health. Sometimes perhaps we err by focusing too much on a single component and have to constantly remind ourselves to come back to the total diet in our considerations.

The first guideline of the dietary guidelines is, after all, eat a variety of foods.

Senator ROTH. That is a very astute observation.

Well, thank you, Mr. Chairman.

Senator BINGAMAN. Thank you.

Senator Sasser had a question he was going to ask. Go ahead.

Senator SASSER. Thank you, Mr. Chairman. I am very interested in these hearings today, but unfortunately we have five committee meetings simultaneously and I have never quite mastered the knack of being in five places at one time.

Dr. Wynder, would you advocate teaching more extensive nutrition courses in medical school, even for those students who are not studying to be nutritionists? It is my understanding that medical students get as little as a one-day course in nutrition.

From my conversations with physicians, excellent physicians who know a lot about the treatment of illness, sometimes it appears to me that their knowledge of nutrition appears to be a little shallow and they do not appear to be giving much credence to the necessity of good nutrition. Am I right or wrong about that?

Dr. WYNDER. Well, you are most certainly correct. Nutrition teaching is not on the top burner in our medical schools. After all, we learn as young students that the first question we ask the patient is what is your chief complaint, other than how well are you.

I think this is a problem with the medical schools, but I think it is, of course, broader. It is a problem with preventive medicine as a whole. A lot of young people go into medicine to be healers; they all want to be like Dr. DeBakey. That is, of course, what makes the headlines.

So I think it is in part what a young student sees his academic and economic fortune in life to be. But, clearly, I would encourage all medical schools to have a compulsory course in nutrition, in nutrition education, and grade such a course.

But, finally, if we are going to really make the doctors become more nutrition-oriented and more preventive-oriented, it is what the consumer will demand from his or her own doctor.

One of the things we have learned from our cholesterol screening all over the country is that now the consumer goes to the doctor and says, look, I have got a level of 280 milligrams percent; what does it mean and what can you do about it?

So I think I would encourage the consumer to become educated in prevention and in nutrition. By educating the consumer and the doctor, maybe we will do a better job in the future.

Senator **Sasser**. Mr. Gordon, in your prepared statement you mentioned so-called high-risk groups, and also you alluded to those who were most vulnerable to nutrition problems.

Could you amplify on that? Who are the high-risk groups? Who are those most vulnerable to nutrition problems?

Mr. **Gordon**. Several speakers have alluded to those groups this morning, Senator. Those are the very young, the very old, the infirm, the very poor, the residents in nursing homes and people like that.

To follow up on a previous question and to add to this, someone asked which group we should really be targeting most in terms of implementation. We have the most to gain in terms of targeting the young, as compared with other groups.

It may be impossible to target all of them, but we can do more than we now do.

Senator **Sasser**. As you know, we are a country whose population is aging, and aging fairly rapidly. When you see the figures with regard to those who are going to fall in the category of the very old—and that is over 85 years of age—that age group is literally going to explode in the next decade or two.

We are going to have to also come to grips with the fact that the medical cost of treating this older population is simply going to be staggering. We are seeing it already with the problems that we have in Medicare. I predict that this is going to be the next great national dialogue, Mr. Chairman, what is to be done about fixing Medicare? A few years ago we were concerned about what is to be done about fixing Social Security.

But my question really is what role can nutrition play in keeping this older, aging population more healthy and less of a drain on the medical care system. Does anybody want to tackle that? Does better nutrition have a significant role to play in keeping the older population healthy, out of the hospitals, and out of the doctors' offices? Can we save a significant amount of money through better nutrition in medical costs? Does anybody want to comment on that?

Dr. **Neville**. I would be willing to at least start the dialogue on it. I think we have a great deal of evidence that individuals in good nutritional status are much better able to withstand the traumas and illnesses of life.

Indeed, to that point, good medicine says that if you have an option for surgery, you should see to it that your patient has good nutritional status before the surgery is undertaken.

This is an important point, and as important as it is to address the needs of our children, we also need to recognize that in addressing our needs of our adults at the age of 40 now, we may be saving the Nation a great deal of problems in terms of 40 years later when these people are the 80 and 85-year-olds that you are talking about.

There is certainly splendid evidence that suggests that changing dietary patterns or following certain dietary patterns will reduce the risk of premature death from heart disease.

There is excellent evidence that shows that attention to dietary food and nutrition matters will indeed reduce the risk of adult onset of diabetes mellitus. We certainly have a lot of evidence in terms of the problems of calcium metabolism in women past menopause. They are beginning to show up in men now because the men, too, are living longer.

If we could clearly identify these problems now through a good nutrition monitoring system where we get nutritional data, then we can define these programs and institute preventive measures through appropriate education where the appropriate dietary habits, the things that each one of us do in our day-to-day lives in terms of the foods and things that we chose to consume and to drink, can make a difference.

There is evidence there, and if you would like I would be happy to submit some material later.

Senator **Sasser**. Yes, I would like to have that.

Mr. **Gordon**. Mr. Chairman, I would also emphasize that I think we as public health practitioners should convey the message that people not only live longer, but will live better through good nutrition and other proper public health disease prevention and health promotion practices. That is sometimes more appealing to people than actually living longer.

Senator **Sasser**. Dr. Wynder?

Dr. **Wynder**. Well, we need to recognize again that nutrition is one element that relates to useful longevity. Obviously, we ought to be modeled in calories, probably a relatively high fiber food intake for proper bowel movement, and good physical activity.

Again, I have in my library a volume of a hundred people who got to be more than a hundred years old in 1799, and all they really had in common was they ate rather sparingly and exercised a lot.

A final point: It also relates to how we as a society look at our older people. As you know, a lot of people who are retired have health problems on retirement. That is in part because we as a society do not have the respect for older people that other societies have. We do not properly utilize older people as some other societies do.

So this all ought to be brought together if we want our old people to die young in life as late in life as possible.

Senator **Sasser**. One final question, Mr. Chairman, if I may. What do you say to the proposition that it is a cost efficient expenditure of funds to try to expand feeding programs for older people—cost efficient in the sense that if these older citizens are getting proper nutrition out of these feeding programs. Will we save money in the long run in Medicare outlays? Can we make a case for that?

Ms. **O'Malley**. I certainly think we can. It has been proven that the WIC program, which is targeted to pregnant women and young children, saves three dollars in medical costs for every dollar spent.

I would think that the same could be said for programs targeted to the elderly. There are certainly a lot of diseases—I am not a doctor, but there are certainly a lot of diseases that elderly people are prone to, diabetes, heart disease, those kinds of things, where diet is a prominent part of the treatment. So I would think that that would be a natural result.

Senator **SASSER**. Do you want to amplify on that, Dr. Swan?

Dr. **SWAN**. Senator Sasser, yes. It seems to me also, in addition to the question of expansion of these programs, we have always the question of making the programs more effective, which is not always expansion, though it may involve expansion.

To my mind, this is one of the advantages of better monitoring. We need to understand more about the nutritional status of people as they age and the relationship between that and their health, and we need to know who is not in good nutritional status and why they are not. Maybe as a result of that better knowledge, we will be able to design more effective programs.

Senator **SASSER**. Thank you very much. Mr. Chairman, I thank you. I might leave with one observation. A few years ago, Senator Pell and I journeyed to the Soviet Union and went to Georgia to see the very old people there. We were fascinated with them.

They had a group of gerontologists studying these old people. Some of these old people lived to well over a hundred years of age, and we were inquiring as to nutrition and what role this played in their longevity. The Soviet gerontologists were not sure.

But we went out to a picnic with them and one older lady introduced me to her youngest son, who was 70 years of age, and while we were standing there talking I noticed someone brought in a bottle of wine.

And this older lady in excess of a hundred years old poured herself a water glass full of red wine and just drank it down, and I have often wondered if the secret to the longevity in Georgia is drinking water glasses full of wine.

Thank you very much.

Senator **BINGAMAN**. Thank you very much, Senator Sasser.

I thank you all very much for your testimony.

Our final panel consists of representatives from two groups, Mr. Chuck Ball with the National Cattlemen's Association and the American Meat Institute, and Mr. Bill Perry and Debby DeLacy with Milk Marketing, Incorporated, from Strongsville, Ohio, if they would please come forward.

Let me make two announcements. People in the audience or witnesses should be reminded that we will keep the hearing record open until March 28, which is next Monday, for any additional submissions or statements by interested parties.

Also, I have been informed that due to an emergency, Senator Boschwitz is not able to appear today, but he will submit testimony for the record indicating his strong support for the legislation.[1]

Let me advise this panel that we are in the unfortunate circumstance of having a vote scheduled at 12:00, and I would urge that you folks summarize your statements, if you could, rather than read them; make the main points that you have to make. We will certainly include your full statements in the record, and if there are a few moments before 12:00, I will ask questions. Otherwise, we will have to submit some of those for the record.

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[1] See p. 454.

Mr. Ball, why do you not go right ahead? Let me indicate that you are representing the Cattlemen's Association, the American Meat Institute, and National Grange. We welcome you to this hearing and look forward to your statement.

TESTIMONY OF CHUCK BALL ON BEHALF OF THE NATIONAL CATTLEMEN'S ASSOCIATION, THE AMERICAN MEAT INSTITUTE, THE NATIONAL GRANGE, AND THE AMERICAN FARM BUREAU FEDERATION, DENVER, CO

Mr. **Ball**. Thank you, Mr. Bingaman. It is indeed a pleasure to be here today and to share our views with you. I would like to add to that list that the American Farm Bureau Federation has also asked me to represent them this morning.

Senator **Bingaman**. Okay.

Mr. **Ball**. Per your request, I will summarize my statement and ask that the full testimony be entered in the record.[1]

Mr. Chairman, the agricultural interests do support the development and dissemination of sound nutritional advice to the American public, and we support legislation which would create a comprehensive and coordinated national nutrition monitoring system.

But nutrition monitoring is only part of the scope of S. 1081. Not only should USDA and HHS coordinate their nutrition monitoring activities, they should coordinate their dietary guidance activities as well.

We are now faced with a situation where many Federal agencies are involved in the various aspects of diet health research. Yet, under the current system each agency is largely autonomous when issuing dietary guidance based on its research findings.

Consequently, we continually run the risk of contradictory dietary advice coming from various agencies, and at the very least the dietary guidance itself suffers because of the lack of coordination. An example would help me illustrate what I am talking about.

In late 1984, the National Cancer Institute planned a pamphlet entitled "Diet, Nutrition, and Cancer: A Guide to Food Choices." The pamphlet contained a number of errors. In particular, it contained several tables which listed the fat content for a variety of foods.

Since the objective of the pamphlet was to encourage Americans to make food choices based on fat content, the tables were particularly pertinent to the publication. Unfortunately, NCI was using nutrient composition data that was outdated and which dramatically overstated the fat content of the meat products.

Congressional members intervened, stopped distribution of the pamphlet, and required that USDA review it before there was any further distribution. If this pamphlet had been widely distributed, it would not only have done agricultural producers a disservice, it would have misled the American public.

Last year, we had exactly the same experience with the Food and Drug Administration in the FDA consumer magazine where again they were quoting outdated food nutrient composition data, and this type of thing will go on again and again until we establish some sort of formal process to require coordination.

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[1] See p. 440.

Additionally, agriculture is modifying its food production practices to produce more healthful products, and it is going to be more and more difficult to keep government agencies abreast with state-of-the-industry food production.

This is the reason that we feel that USDA must play an integral role in the dietary guidance process. The USDA maintains close contact with the food industry. In fact, it is often USDA funding that enables the research to happen that causes these changes or monitors their impact. So USDA is in a good position to know the impact that these developments will have on dietary guidance.

If we are truly concerned about providing accurate and up-to-date dietary guidance to the American public, both departments must be involved in the process of developing that guidance.

The groups I represent also believe that having a single set of dietary guidelines that represents official Federal nutrition policy would also help avoid confusion among the public.

By involving both USDA and HHS in the development of the dietary guidelines for Americans and then using this document as the basis for all Federal nutrition policy, we could make further strides in achieving consistency.

To achieve these objectives, the agricultural groups that I represent would support an amendment to S. 1081 which would strike the existing Title III and replace it with language requiring joint publication of the dietary guidelines for Americans and joint approval of all dietary guidance prior to its release. We expect legislation which would accomplish this to be introduced prior to the mark-up of S. 1081.

One of the concerns that has been raised about this particular proposal is that USDA would have too much influence over HHS' dietary guidance, and I would like to respond with two points there.

Number one, we would expect neither department to exert influence in an area in which it has no expertise. When USDA was given the opportunity to review and make recommendations on the Cancer Institute publication which I mentioned earlier, the department did not challenge the scientific basis for the guidance.

Instead, USDA limited its comments to those areas for which it had clearly conflicting and more accurate data, which in this case was the fat composition of various foods. We would expect the same kind of restraint by both departments on any other proposed dietary guidance.

The second point, Mr. Chairman, is that we do not even have consistency right now within each department. I would like to quote two documents very briefly for you to illustrate this.

One is the report of the Adult Treatment Panel of the National Cholesterol Education Program. The other is a working draft of a document entitled "Eating Well." It is developed by Education Development Center, Incorporated, in partnership with the Center for Health Promotion and Education, Centers for Disease Control.

So we have two documents; they are from two different agencies, one from the Heart, Lung and Blood Institute, and one from CDC, but both within the same department. In the Adult Treatment Panel report, "Meat products are rich in protein and contain iron in a form that is well absorbed. Thus, meat can be included in a diet otherwise designed to lower serum cholesterol, although meat fat needs to be curtailed."

Since the context of this report, Mr. Chairman, is that this is a report for treatment of individuals who are already identified as having a risk of developing chronic heart disease, the message that I hear for the average consumer is that meat is okay, fat is not. In fact, in the report it also mentions a caution for pre-menopausal women: avoid the severe reduction of lean red meat.

The other document I mentioned, "Eating Well," says quite simply, eat less beef, pork and lamb. I am getting two different messages from two different publications from within the same department, and I think that an approval process such as we are promoting here or asking you for would help eliminate these sorts of problems.

We also have some recommendations regarding Titles I and II, but you will find those in my testimony on pages 8 through 11. With changes and a new Title III, the agricultural organizations I represent today would wholeheartedly endorse S. 1081.

Once again, Mr. Chairman, I thank you for the opportunity to be here today and share our concerns with you. We look forward to working with you and your staff in developing a nutritional monitoring act that we can all support.

Senator BINGAMAN. Thank you very much for that testimony.

The last group represented in this panel is Milk Marketing, Inc. Ms. Debbie DeLacy is the Director of Nutrition Education for the Mid-East United Dairy Association and the Dairy Nutrition Council, both of which are headquartered Columbus, Ohio.

We welcome you.

TESTIMONY OF DEBBIE DeLACY, DIRECTOR, NUTRITION EDUCATION, MID EAST UNITED DAIRY ASSOCIATION AND DAIRY NUTRITION COUNCIL, ON BEHALF OF MILK MARKETING, INC., AND THE NATIONAL MILK PRODUCERS FEDERATION, STRONGSVILLE, OH,[1] ACCOMPANIED BY BILL PERRY

Ms. DELACY. Thank you. In addition to representing Milk Marketing, Incorporated, which is a farmer-owned dairy marketing group, a cooperative of over 7,000 dairy farmers in eight Midwest States, I also want to state for the record that the viewpoint expressed in my statement is representative of the National Milk Producers Federation, too.

Senator BINGAMAN. Okay.

Ms. DELACY. This is a national farm commodity organization which represents dairy farmers and the dairy marketing cooperatives they own and operate throughout the United States.

We are pleased to be here to support legislation S. 1081, which will create a comprehensive and coordinated national nutrition monitoring system. We believe that this type of system is necessary to provide timely and accurate information upon which government nutrition policies and funding decisions can be accurately based.

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[1] See p. 451 for Ms. DeLacy's prepared statement.

In addition, our particular industry would benefit from timely and accurate data which can be used in formulating our research initiatives and public education programs. We also emphatically believe and insist that the nutrition monitoring legislation include a comprehensive and coordinated procedure by which dietary guidelines and guidance of all government agencies are issued to the general population to eliminate the current situation that can only be described as conflicting, confusing and contradictory.

Perhaps no segment of the American population better understands the need for sound nutrition policies than the American farmer. It is the farmer, after all, who produces this Nation's abundant food supply.

Farmers have been pioneers in implementing nutrition information and research into the diets of their livestock. Their livelihoods have been enhanced by nutrition research and monitoring of individual animal forage, which results in increased animal productivity and health.

S. 1081, which would create a monitoring system for human nutrition in the United States, is simple and sound government policy to coordinate the many government nutrition surveys, their programs, expenditures and policies, based on timely and accurate information.

Taxpayers are better served if our limited financial resources are spent wisely in a comprehensive and coordinated fashion rather than in unnecessary duplication. We support the concept of nutrition monitoring to ensure that the American population utilizes our food resources in the best way possible for their health, growth and development.

Mr. Chairman, Title III was attached per the request of agricultural organizations. We believe that the U.S. Government should speak as one consistent voice on dietary guidelines. Our preference would be that the Secretary of Agriculture have veto power over dietary guidance issued by any Government agency.

However, a coordinated procedure between the Secretaries of Agriculture and Health and Human Services, along with a checklist which forces agencies to identify who the dietary guidance is intended for, who might be at risk if they follow the guidance, what previous research or findings are being overruled or challenged, and so forth—this would hopefully work as an acceptable compromise.

Like other commodity and farm groups, the dairy industry is very concerned about the impact U.S. dietary guidelines have had on the public's overall nutrition knowledge. The focus on fat, cholesterol, sodium, and other "bad components of food" has completely distorted the public's knowledge of the overall daily nutrient needs, the variations that occur throughout life, and the role of genetics and other health factors.

How many Americans know that children need more fat than adults for energy and growth? How many people realize that cholesterol levels may be controlled by genetics and not only diet?

How many people realize that attempts to completely eliminate sodium from their diets could impair their health? I bet most

Americans would be absolutely amazed to know that there are more grams of fat in a chef's salad, which would have 23.5 grams without the dressing, than a cheeseburger, 15 grams of fat. This is a cheeseburger that would be purchased, say, from a MacDonald's. Add one tablespoon of Italian dressing and you add another nine grams of fat.

The trend to judge certain foods as bad due to their natural components, we feel, is a direct result of the dietary guidelines. While that was not the intent of the guidelines, it certainly has become the effect as the guidelines get translated into recommendations on diet for Americans.

Therefore, we submit that government's role in issuing dietary guidelines and guidance must be reexamined. We must have a public discussion on the impact of these guidelines, their emphasis on the negative rather than the positive, and how the dietary guidelines and other agencies' guidances get issued, reported and interpreted to the general public, and what process can be established to provide nutrition and diet recommendations by government agencies in a clear and consistent fashion.

The government's responsibility to ensure that there is adequate food through both its agriculture and human nutrition programs is not being challenged. We are challenging the procedure, the substance, and the lack of overall consistency in the government's dietary guidelines.

We believe it is time to redirect the focus of the government's dietary recommendations back to the basics, to encourage the public to eat from the basic food groups, and do so in moderation, to recognize that the majority of the population is not at risk and best served by following basic guidelines.

In conclusion, Mr. Chairman, we support S. 1081, which will create coordination between government agencies in their collection of reporting nutritional data. We would like to see Title III revised to include a one-secretary veto power over all government agencies who give dietary guidance or, at a minimum, creation of a checklist which will force agencies to report their recommendations in a manner that is easily understood by the general public and to eliminate the confusion that is currently being created by contradictory recommendations.

Thank you.

Senator BINGAMAN. Thank you very much.

Mr. Perry, did you have some comments you wanted to make?

Mr. PERRY. Senator, our comments are capsuled very well by Debby's testimony and we have no further testimony.

Senator BINGAMAN. Okay. Well, we appreciate your comments very much.

Again, I thank you for testifying and we will take your views into account as we go forward on this legislation. We appreciate very much your coming to testify today.

Mr. PERRY. Thank you, sir.

Senator BINGAMAN. My closing statement will be included in the record.

[The statement referred to follows:]

CLOSING STATEMENT OF SENATOR BINGAMAN

I would like to thank each of the witnesses for the expert testimony, candid opinions, and guidance they have given us today. And I want especially to thank the members of the audience for their interest and attendance.

I believe we have achieved some important results today. We have reviewed the issues of nutrition monitoring and dietary guidance. We have carefully examined a piece of legislation that has been very important to me for some time, S. 1081, the National Nutrition Monitoring and Related Research Act.

We have examined the many benefits and problems associated with a coordinated, national nutrition monitoring system. And finally, we have learned of current efforts and successful programs that have been implemented largely as a result of the interest and determination of people in this room.

We have begun to lay a firm foundation from which we in the Senate can—and must—build. We certainly have a long way to go in our efforts to improve the health status of the citizens of this country, but I believe S. 1081 is a key element of that effort. As I mentioned earlier, I do not believe it is possible to make informed decisions of important legislation without current baseline data on the nutritional and health status of the U.S. population. I do not believe we can possibly know whether our current policies are having the intended effect, or whether we should be making crucial changes that would be evident if only we had better information. I do believe that S. 1081 would help clarify these important issues.

Again, thank you for your attendance.

Senator BINGAMAN. I would again thank all of those who have participated in this hearing. Let me thank some of the folks who have helped prepare for this hearing: the Governmental Affairs Committee staff, Dr. Eileen Choffnes, Andrea Fastenberg; from Senator Glenn's staff, Diane Lifsey; and my staff, Ed Jayne and Carrie Billy; and from the Congressional Research Service, Donna Porter, who also prepared the report that Senator Glenn referred to earlier today. They have all worked hard to get the witnesses here and to prepare us to consider this bill, so we thank them as well.

We will conclude the hearing.

[Whereupon, at 12:05 p.m., the Committee was adjourned.]

APPENDIX

II

100TH CONGRESS
1ST SESSION

S. 1081

To establish a coordinated National Nutrition Monitoring and Related Research Program, and a comprehensive plan for the assessment of the nutritional and dietary status of the United States population and the nutritional quality of the United States food supply, with provision for the conduct of scientific research and development in support of such program and plan.

IN THE SENATE OF THE UNITED STATES

APRIL 23 (legislative day, APRIL 21), 1987

Mr. BINGAMAN (for himself, Mr. KENNEDY, Mr. GLENN, Mr. HARKIN, Mr. MATSUNAGA, Mr. RIEGLE, Mr. DURENBERGER, Mr. LEVIN, Mr. SIMON, Mr. HOLLINGS, Mr. BOSCHWITZ, Ms. MIKULSKI, and Mr. BURDICK) introduced the following bill; which was read twice and referred to the Committee on Governmental Affairs

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A BILL

To establish a coordinated National Nutrition Monitoring and Related Research Program, and a comprehensive plan for the assessment of the nutritional and dietary status of the United States population and the nutritional quality of the United States food supply, with provision for the conduct of scientific research and development in support of such program and plan.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "National Nutrition Monitoring and Related Research Act of 1987".

PURPOSES

SEC. 2. The purposes of this Act are to—

(1) make more effective use of Federal and State expenditures for nutrition monitoring, and enhance the performance and benefits of current Federal nutrition monitoring and related research activities;

(2) establish and facilitate the timely implementation of a coordinated National Nutrition Monitoring and Related Research Program, and thereby provide a scientific basis for the maintenance and improvement of the nutritional status of the people of the United States and the nutritional quality of the United States food supply;

(3) establish and implement a comprehensive plan for the National Nutrition Monitoring and Related Research Program to assess, on a continuing basis, the dietary and nutritional status of the people of the United States and the trends with respect to such status, the state of the art with respect to nutrition monitoring and related research, future monitoring and related research priorities, and the relevant policy implications;

(4) establish and improve the quality of national nutritional and health status data and related data bases and networks, and stimulate research necessary to develop uniform indicators, standards, methodologies, technologies, and procedures for nutrition monitoring;

(5) establish a central Federal focus for the coordination, management, and direction of Federal nutrition monitoring activities;

(6) establish mechanisms for addressing the nutrition monitoring needs of Federal, State, and local governments, the private sector, scientific and engineering communities, health care professionals, and the public in support of the foregoing purposes; and

(7) provide for the conduct of such scientific research and development as may be necessary or appropriate in support of such purposes.

DEFINITIONS

SEC. 3. As used in this Act—

(1) the term "nutrition monitoring and related research" means the set of activities necessary to provide timely information about the role and status of factors that bear on the contribution that nutrition makes to the health of the people of the United States, including (A) dietary, nutritional, and health status measurements, (B) food consumption measurements, (C) food

composition measurements and nutrient data banks, (D) dietary knowledge and attitude measurements, and (E) food supply and demand determinations;

(2) the term "coordinated program" means the National Nutrition Monitoring and Related Research Program established by section 101(a);

(3) the terms "Interagency Board for Nutrition Monitoring and Related Research" and "Board" mean the Federal coordinating body established by section 101(c);

(4) the term "comprehensive plan" means the comprehensive plan prepared under section 103;

(5) the term "Joint Implementation Plan for a Comprehensive National Nutrition Monitoring System" means the plan of that title submitted to Congress in September 1981 by the Department of Agriculture and the Department of Health and Human Services, under section 1428 of the Food and Agriculture Act of 1977 (7 U.S.C. 3178);

(6) the terms "National Nutrition Monitoring Advisory Council" and "Council" mean the advisory body established under section 201;

(7) the term "Secretaries" means the Secretary of Agriculture and the Secretary of Health and Human Services, acting jointly; and

(8) the term "local government" means a local general unit of government or local educational unit.

TITLE I—NUTRITION MONITORING AND RELATED RESEARCH

ESTABLISHMENT OF THE COORDINATED PROGRAM

SEC. 101. (a) There is hereby established a ten-year coordinated program, to be known as the National Nutrition Monitoring and Related Research Program, to carry out the purposes of this Act.

(b) The Secretaries shall be responsible for the implementation of the coordinated program.

(c) To assist in implementing the coordinated program, there is hereby established an Interagency Board for Nutrition Monitoring and Related Research, of which an Assistant Secretary in the Department of Agriculture (designated by the Secretary of Agriculture) and an Assistant Secretary in the Department of Health and Human Services (designated by the Secretary of Health and Human Services) shall be joint chairpersons. The remaining membership of the Board shall consist of additional representatives of Federal agencies, as deemed appropriate by the joint chairpersons of the Board. The Board shall meet no less often than once every three months.

(d) To establish a central focus and coordinator for the coordinated program, the Secretaries may appoint a full-time

Administrator of Nutrition Monitoring and Related Research. The Administrator shall—

(1) be an individual who is eminent in the field of nutrition monitoring and related areas, and be selected on the basis of his or her established record of expertise and distinguished service; and

(2) administer the coordinated program with the advice and counsel of the joint chairpersons of the Board, serve as the focal point for the coordinated program, and serve as the Executive Secretary for the National Nutrition Monitoring Advisory Council.

FUNCTIONS OF THE SECRETARIES

SEC. 102. (a) The Secretaries, with the advice of the Board, shall—

(1) establish the goals of the coordinated program and identify the activities required to meet such goals, and identify the responsible agencies with respect to the coordinated program;

(2) update the Joint Implementation Plan for a Comprehensive National Nutrition Monitoring System, and integrate it into the coordinated program;

(3) ensure the timely implementation of the coordinated program and the comprehensive plan prepared under section 103;

(4) include in the coordinated program and the comprehensive plan a competitive grants program, in

accordance with the provisions of this Act, to encourage and assist the conduct, by Federal and non-Federal entities on an appropriate matching funds basis, of research (including research described in section 103(a)(3)) that will accelerate the development of uniform and cost-effective standards and indicators for the assessment and monitoring of nutritional and dietary status and for relating food consumption patterns to nutritional and health status;

(5) include in the coordinated program and the comprehensive plan a grants program, in accordance with the provisions of this Act, to encourage and assist State and local governments in developing the capacity to conduct monitoring and surveillance of nutritional status, food consumption, and nutrition knowledge and in using such capacity to enhance nutrition services (including activities described in sections 103(a)(5) and 103(b)(9));

(6) include in the coordinated program each fiscal year an annual interagency budget for each fiscal year of the program;

(7) foster productive interaction, with respect to nutrition monitoring and related research, among Federal efforts, State and local governments, the private

sector, scientific communities, health professionals, and the public;

(8) contract with a scientific body, such as the National Academy of Sciences or the Federation of American Societies for Experimental Biology, to interpret available data analyses, and publish every two years, or more frequently if appropriate, a report, on the dietary, nutritional, and health-related status of the people of the United States and the nutritional quality of the national food supply; and

(9)(A) foster cost recovery management techniques in the coordinated program, and (B) impose appropriate charges and fees for publications of the coordinated program, including print and electronic forms of data and analysis, and use the proceeds of such charges and fees for purposes of the coordinated program (except that no such charge or fee imposed on an educational or other nonprofit organization shall exceed the actual costs incurred by the coordinated program in providing the publications involved).

(b) The Secretaries shall submit to the President for transmittal to Congress by January 15 of each year an annual report that shall—

(1) evaluate the progress of the coordinated program;

(2) summarize the results of such coordinated program components as are developed under section 103;

(3) analyze the dietary, nutritional, and related health status of the people of the United States, the nutritional quality of the national food supply, the relevant policy implications of the analytical findings, and future nutrition monitoring and related research priorities;

(4) include in full the annual report of the Council provided for in section 202; and

(5) include an executive summary of the report most recently published by the scientific body, as provided for in subsection (a)(8).

DEVELOPMENT OF THE COMPREHENSIVE PLAN FOR THE NATIONAL NUTRITION MONITORING AND RELATED RESEARCH PROGRAM

SEC. 103. (a) The Secretaries, with the advice of the Board, shall prepare and implement a comprehensive plan for the coordinated program which shall be designed to—

(1) assess, collate data with respect to, analyze, and report, on a continuous basis, the dietary and nutritional status of the people of the United States, and the trends with respect to such status (dealing with such status and trends separately in the case of preschool and school-age children, pregnant and lactating women, elderly individuals, low income populations,

blacks, Hispanics, and other groups, at the discretion of the Secretaries), the state of the art with respect to nutrition monitoring and related research, future monitoring and related research priorities, and relevant policy implications of findings with respect to such status, trends, and research;

(2) assess, analyze, and report, on a continuous basis, for a representative sample of the low income population, food and household expenditures, participation in food assistance programs, and periods experienced when nutrition benefits are not sufficient to provide an adequate diet;

(3) sponsor or conduct research necessary to develop uniform indicators, standards, methodologies, technologies, and procedures for conducting and reporting nutrition monitoring and surveillance;

(4) develop and keep updated a national dietary and nutritional status data bank, a nutrient data bank, and other data resources as required;

(5) assist State and local government agencies in developing procedures and networks for nutrition monitoring and surveillance; and

(6) focus the activities of the Federal agencies.

(b) The comprehensive plan, at a minimum, shall include components to—

(1) maintain and coordinate the National Health and Nutrition Examination Survey (NHANES) and the Nationwide Food Consumption Survey (NFCS);

(2) provide, by 1990, for the continuous collection, processing, and analysis of nutritional and dietary status data through a stratified probability sample of the people of the United States designed to permit statistically reliable estimates of high-risk groups and geopolitical and geographic areas, and to permit accelerated data analysis (including annual analysis, as appropriate);

(3) maintain and enhance other Federal nutrition monitoring efforts such as the Centers for Disease Control Nutrition Surveillance Program and the Food and Drug Administration Total Diet Study, and, to the extent possible, coordinate such efforts with the surveys described in paragraphs (1) and (2);

(4) incorporate, in survey design, military and (where appropriate) institutionalized populations;

(5) complete the analysis and interpretation of the data sets from the surveys described in paragraph (1) collected prior to 1984 within the first year of the comprehensive plan;

(6) improve the methodologies and technologies, including those suitable for use by States and localities,

available for the assessment of nutritional and dietary status and trends;

(7) develop uniform standards and indicators for the assessment and monitoring of nutritional and dietary status, for relating food consumption patterns to nutritional and health status, and for use in the evaluation of Federal food and nutrition intervention programs;

(8) establish national baseline data and procedures for nutrition monitoring;

(9) provide scientific and technical assistance, training, and consultation to State and local governments for the purpose of obtaining dietary and nutritional status data and developing related data bases and networks to promote the development of regional, State, and local data collection services to become an integral component of a national nutritional status network;

(10) establish mechanisms to identify the needs of users of nutrition monitoring data and to encourage the private sector and the academic community to participate in the development and implementation of the comprehensive plan and contribute relevant data from non-Federal sources to promote the development of a national nutritional status network;

(11) compile an inventory of Federal, State, and nongovernment activities related to nutrition monitoring and related research;

(12) focus on national nutrition monitoring needs while building on the responsibilities and expertise of the individual membership of the Board;

(13) administer the coordinated program, define program objectives, priorities, oversight, responsibilities, outcomes, and resources, and define the organization and management of the Board and the Council; and

(14) provide a mechanism for periodically evaluating and refining the coordinated program and the comprehensive plan that facilitates cooperation and interaction by State and local governments, the private sector, scientific communities, and health care professionals, and that facilitates coordination with non-Federal activities.

(c) The comprehensive plan shall allocate all of the projected functions and activities under the coordinated program among the various Federal agencies and offices that will be involved, and shall contain an affirmative statement and description of the functions to be performed and activities to be undertaken by each of such agencies and offices in carrying out the coordinated program.

(d) The comprehensive plan shall—

(1) be submitted in draft form to the President for submission to Congress, and for public review, within twelve months after the date of the enactment of this Act;

(2) be available for public comment for a period of sixty days after its submission in draft form under paragraph (1) by means of publication in the Federal Register;

(3) be submitted in final form, incorporating such needed revisions as may arise from comments received during the review period, to the President for submission to Congress within sixty days after the close of the period allowed for comments on the draft comprehensive plan under paragraph (2); and

(4) constitute the basis on which each agency participating in the coordinated program requests authorizations and appropriations for nutrition monitoring and related research during the ten-year period of the program.

(e) Nothing in this section may be construed as modifying, or as authorizing the Secretaries or the comprehensive plan to modify, any provision of an appropriation Act (or any other provision of law relating to the use of appropriated funds) that specifies (1) the department or agency to which funds are appropriated, or (2) the obligations of such department or agency with respect to the use of such funds.

IMPLEMENTATION OF THE COMPREHENSIVE PLAN

SEC. 104. (a) The comprehensive plan shall be carried out during the period ending with the close of the ninth fiscal year following the fiscal year in which the comprehensive plan is submitted in its final form under section 103(d)(3), and shall be—

(1) carried out in accord with, and meet the program objectives specified in, section 103(a) and paragraphs (1) through (11) of section 103(b);

(2) managed in accord with paragraphs (12) through (14) of section 103(b);

(3) carried out, by the Federal agencies involved, in accord with the allocation of functions and activities under section 103(c); and

(4) funded by appropriations made to such agencies as described in section 106, for each fiscal year of the program.

Congress through its appropriate authorizing committees shall exercise continuing oversight over the coordinated program, taking into account the Secretaries' annual reports and such other information and data as may be developed.

(b) Nothing in this title may be deemed to grant any new regulatory authority or to limit, expand, or otherwise modify any regulatory authority under existing law, or to establish new criteria, standards, or requirements for regulation under existing law.

SCIENTIFIC RESEARCH AND DEVELOPMENT IN SUPPORT OF THE COORDINATED PROGRAM AND COMPREHENSIVE PLAN

SEC. 105. The Secretaries shall provide for and coordinate the conduct, by the National Science Foundation, the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the National Bureau of Standards, and other suitable Federal agencies, of such scientific research and development as may be necessary or appropriate in support of the coordinated program and the comprehensive plan and in furtherance of the purposes and objectives of this Act.

AUTHORIZATIONS AND APPROPRIATIONS

SEC. 106. (a) Authorizations and appropriations for the fiscal year in which the comprehensive plan is submitted in final form under section 103(d)(3) and for the nine succeeding fiscal years, for purposes of carrying out the coordinated program and implementing the comprehensive plan, shall be requested by the Secretaries and by each of the agencies that are allocated responsibilities under the coordinated program under section 103(c), in a separate line item of the budget of the agency involved and consistent with the interagency budget for the coordinated program.

(b) Nothing in this title is intended either (1) to authorize the appropriation or require the expenditure of any funds in excess of the amount of funds that would be authorized or expended for the same purposes in the absence of the coordinated program, or (2) to limit the authority of any of the participating agencies to request and receive funds for those purposes (for use in the coordinated program) under other laws.

TITLE II—NATIONAL NUTRITION MONITORING ADVISORY COUNCIL

ESTABLISHMENT OF THE COUNCIL

SEC. 201. (a)(1) The President shall establish, within ninety days after the date of the enactment of this Act, a National Nutrition Monitoring Advisory Council. The Council shall assist in carrying out the purposes of this Act, provide scientific and technical advice on the development and implementation of the coordinated program and comprehensive plan, and serve in an advisory capacity to the Secretaries.

(2) The Council shall consist of eleven voting members, of whom—

(A) seven members shall be appointed by the President; and

(B) four members shall be appointed by Congress—one by the Speaker of the House of Representatives, one by the minority leader of the House of Representatives, one by the President pro tempore of the Senate, and one by the minority leader of the Senate.

(3) The Council also shall include the joint chairpersons of the Board as ex officio nonvoting members.

(b) Each person appointed to the Council shall be—

(1) eminent in the field of administrative dietetics, clinical dietetics, community nutrition research, public health nutrition, nutrition monitoring and surveillance, nutritional biochemistry, food composition and nutrient analysis, health statistics management, epidemiology, food technology, clinical medicine, public administration, health education, nutritional anthropology, food consumption patterns, food assistance programs, agriculture, or economics; and

(2) selected solely on the basis of an established record of distinguished service.

(c) The persons appointed to the Council by the President shall include—

(1) one member who is a director of a nutrition research unit that is primarily supported by Federal funds, and who has a specialized interest in nutrition monitoring;

(2) one member who is an employee of a State government and has a specialized interest in nutrition monitoring;

(3) one member who is an employee of a local government and has a specialized interest in nutrition monitoring; and

(4) one member who is an appointed representative of the Food and Nutrition Board, National Academy of Sciences.

(d) The Council membership, at all times, shall have representatives from various geographic areas, the private sector, academia, scientific and professional societies, minority organizations, and public interest organizations.

(e) The Chairperson of the Council shall be elected from and by the Council membership. The term of office of the Chairperson shall not exceed five years. In case a vacancy occurs in the Chairpersonship, the Council shall elect a member to fill such vacancy.

(f) The term of office of each of the voting members of the Council shall be five years, except that of the seven members first appointed by the President, one shall be appointed for a term of two years, three for terms of three years, and three for terms of four years, as designated by the President at the time of appointment. Any member appointed to fill a vacancy occurring prior to the expiration of the term for which his or her predecessor was appointed shall be appointed for the remainder of such term. No member shall be eligible to serve continuously for more than two consecutive terms.

(g) The initial members of the Council shall be appointed or designated (without regard to the requirements of the Federal Advisory Committee Act) not later than ninety days after the date of the enactment of this Act.

(h) The Council shall meet on a regular basis at the call of the Chairperson, or on the written request of one-third of the members. A majority of the appointed members of the Council shall constitute a quorum.

(i) Appointed members of the Council shall not be employed by the Federal Government, and shall be allowed travel expenses as authorized by section 5703 of title 5, United States Code.

(j) The Administrator of Nutrition Monitoring and Related Research (if appointed under section 101(d)) shall serve as the Executive Secretary of the Council.

FUNCTIONS OF THE COUNCIL

SEC. 202. The Council shall—

(1) provide scientific and technical advice on the development and implementation of all components of the coordinated program and the comprehensive plan;

(2) evaluate the scientific and technical quality of the comprehensive plan and the effectiveness of the coordinated program;

(3) recommend to the Secretaries, on an annual basis, means of enhancing the comprehensive plan and the coordinated program; and

(4) submit to the Secretaries annual reports that shall contain the components specified in paragraphs (2) and (3), and that shall be included in full in the Secretaries' annual reports to the President for transmittal to Congress under section 102(b).

TITLE III—DIETARY GUIDANCE

ESTABLISHMENT OF DIETARY GUIDELINES

SEC. 301. (a)(1) By January 1, 1990, and at least every five years thereafter, the Secretaries shall publish a report entitled "Dietary Guidelines For Americans". Each such report shall contain nutritional and dietary information and guidelines for the general public, and shall be promoted by each Federal agency in carrying out any Federal food, nutrition, or health program.

(2) The information and guidelines contained in each report required under paragraph (1) shall be based on the preponderance of the scientific and medical knowledge which is current at the time the report is prepared.

(b)(1) Any Federal agency which proposes to issue any dietary guidance for the general population shall submit the text of such guidance to the Secretaries prior to the release of such guidance.

(2)(A) Within 90 days after receiving the text of any proposed dietary guidance pursuant to paragraph (1), the Secretary of Agriculture and the Secretary of Health and Human Services shall review and approve or disapprove such guidance to assure consistency with the "Dietary Guidelines For Americans" in effect on the date such review is made.

(B) If either Secretary approves a proposed dietary guidance, the dietary guidance may be issued on the date which is 90 days after the date of submission of such guidance by the Federal agency under subparagraph (A) or on the date such dietary guidance is approved by both Secretaries, whichever is earlier. If both Secretaries disapprove a proposed dietary guidance, the Secretaries shall notify the Federal agency submitting such guidance of such disapproval, and such guidance may not be issued, except as provided in subparagraph (C).

(C) If a proposed dietary guidance is disapproved by both Secretaries under subparagraph (B), the Federal agency proposing such guidance may, within 15 days after receiving notification of such disapproval under subparagraph (B), request the Secretaries to review such disapproval. Within 15 days after receiving a request for such a review, the Secretaries shall conduct such review. If, pursuant to such review, either Secretary approves such proposed dietary guidance, such guidance may be issued by the Federal agency.

(3) For purposes of this subsection, the term "dietary guidance for the general population" does not include any rule or regulation issued by a Federal agency.

(c) This section does not place any limitations on—

(1) the conduct or support of any scientific or medical research by any Federal agency; or

(2) the presentation of any scientific or medical findings or the exchange or review of scientific or medical information by any Federal agency.

STATEMENT

BY

J. MICHAEL McGINNIS, M.D.

Mr. Chairman, I am Dr. J. Michael McGinnis, Deputy Assistant Secretary for Health for Disease Prevention and Health Promotion with the Public Health Service of the U. S. Department of Health and Human Services, and Chairman of the Department's Nutrition Policy Board. It is a pleasure to appear before you and the Committee members to discuss the Department's current understanding of the relationship between diet and health. We believe that this topic is of vital importance to the Nation's health and we appreciate the leadership your committee is taking in this area.

In recent years, researchers have produced increasingly compelling evidence that dietary patterns and practices influence the risk of developing major chronic disease conditions that constitute the leading causes of death and disability among Americans. This information has been produced in the context of equally compelling data on the ways other genetic, environmental, and behavioral characteristics affect health. The adverse impact of cigarette smoking, insufficient exercise, and excessive consumption of alcohol or drugs has been documented extensively. Diet interacts with these factors in important ways. It also affects disease risk independently.

We have seen, for example, that along with concurrent improvements in sanitation, health care, and living conditions throughout this century, increased availability of food and nutrients has led to substantial improvements in the health of Americans. Between 1900 and 1985, life expectancy at birth increased from 47 to 75 years; for individuals reaching the age of 65, life expectancy after that age increased from 12 to 17 years. A substantial part of the overall improvement in mortality statistics can be attributed to the sharp decline in infant diarrheal diseases that occurred with development of a safe water supply. Improvements in the safety and quantity of the food supply have helped foster these gains by reducing the prevalence of nutrient deficiency diseases as well as by increasing resistance against infectious diseases. The increased availability of essential nutrients, has led to the virtual elimination of rickets, goiter, pellagra, and other nutrient deficiency diseases once responsible for substantial illness and death among Americans.

Despite these evident gains, conditions of nutritional deficiency have not yet been entirely eliminated in the United States. Nutritional deficiency usually occurs as a result of poverty, of the special needs of the very young or very old, of abuse of children or the elderly, or some combinations of these factors. For example, rates of anemia due to inadequate intake of iron are declining in the population as a whole, but they remain higher in children who are poor. Evidence also suggests that the elderly as a group remain at risk for nutritional deficiencies. These high risk groups have been the focus of attention of this Department for many years and have been discussed in detail in other contexts.

Today, I would like to focus on the role of diet in a different type of disease, a type that is now far more prevalent. As infectious and nutrient deficiency diseases have gradually declined in prevalence, they have been replaced by new health problems related to dietary patterns. Increasingly important as causes of illness and death among Americans are diseases such as heart disease, cancer, diabetes, stroke, liver disease, skeletal disease, obesity, dental disease, and kidney disease.

Although hereditary, environmental, and behavioral factors all contribute to the development of these diseases, research has demonstrated the fundamental importance of nutritional factors in their etiology or progression. In contrast to nutritional deficiency diseases caused by inadequate intake of essential nutrients, these conditions are associated primarily with the overconsumption of specific nutritional factors. Among these, fat, cholesterol, salt, and alcohol appear to be the most important.

The patterns of death and disability in this country now reflect the adverse consequences of overeating and lack of exercise. Dietary excesses are a major risk factor for five of the leading causes of death: coronary heart disease, certain cancers, strokes, diabetes, and atherosclerosis. Excessive alcohol consumption contributes to three others: cirrhosis of the liver, accidents, and suicides. These eight conditions are responsible for nearly 70 percent of deaths in the United States. Nutritional factors are also known to contribute to high blood pressure, obesity, dental diseases, kidney and digestive diseases, and osteoporosis.

These important public health problems lend themselves to preventive action for several reasons. They affect millions of Americans and their direct and indirect economic costs are high as I will discuss later in my testimony. These conditions have long developmental periods and are often difficult to diagnose in their asymptomatic stages. Most important, the major risk factors for these diseases are amenable to changes in personal behavior or can be controlled by public health measures.

These conditions are especially susceptible to improved nutritional habits. Certainly there are limits to our knowledge of the relation of diet to health. We know that the relationship is complex, that it varies among individuals and populations, and that environmental, behavioral, and genetic factors come into play. Foods contain a variety of elements; some promote disease, others are protective. Nevertheless, information about the overall effects of Americans' dietary patterns enables us to identify basic changes in eating habits that would greatly enhance health status. As a primary example, Americans would be better protected against certain diseases if they decreased their consumption of foods high in fats and cholesterol and put greater emphasis on foods high in complex carbohydrates--starch and fiber.

Obviously, there are caveats. The knowledge base regarding nutrition and health is incomplete and additional research is needed. Various expert committees agree, in general, about the links between dietary intake, diet-related risk factors, and chronic diseases. However, because the evidence varies in strength and quality and current research information does not always prove causality in the classic scientific sense, it is not always possible to obtain complete consensus about these links. While early nutritional disorders such as beriberi, pellagra, or scurvy were caused by deficiencies of single nutrients, today's chronic diseases arise from a variety of genetic, environmental, and behavioral--especially dietary--causes.

Even where a specific dietary factor is associated with a specific disease, the avoidance of that particular factor will not necessarily prevent the condition. With coronary heart disease, for example, the relation of the consumption of total and saturated dietary fats to increased risk has been demonstrated, and that risk can be reduced by increasing the proportion of mono-and poly-unsaturated fats in the diet. However, genetically-predisposed populations have been identified, and we know that tobacco smoking and high blood pressure contribute to coronary heart disease. Also, individuals metabolize fats in the body differently.

For these reasons, the relationships between dietary factors and disease must be deduced from studies that are more indirect:

- Laboratory measurements of blood nutrient levels or other biochemical measures of nutritional or risk status.
- Dietary studies in laboratory animals.
- Population estimates of the dietary intake of individuals.
- Epidemiologic studies that compare dietary intake and disease rates in different countries or in defined groups within the same country.
- Epidemiologic clinical trials that compare dietary intake and disease rates in defined groups over time.

Each of these types of investigations provides useful information, but each has its limitations. Laboratory measurements reveal only a small part of complex physiological processes and may not reflect current nutritional status. Interpretation of animal studies is always limited by uncertainties about their applicability to humans. Dietary surveys depend on recall of the types and portion sizes of consumed foods and on the assumption that the diet on any one day represents typical intake.

Because recall is rarely perfect, this assumption may not necessarily be correct.

Epidemiologic studies can demonstrate an association or correlation between a dietary risk factor and a disease; they do not necessarily prove that the dietary factor causes the disease. For example, a study indicating that populations consuming high-fat diets exhibit higher rates of breast cancer than populations consuming low-fat diets demonstrates an association between fat and breast cancer, but it must be shown that some alternative genetic, environmental, or other dietary factors might not be the true explanation of the apparent relationship between fat and breast cancer. To be convincing, epidemiologic clinical trials must be conducted with precisely comparable populations under strictly controlled conditions that may be difficult to achieve in groups under study.

These circumstances explain why nutritional evidence rarely comes close to meeting classic scientific standards for proof. Instead, the relationship between diet and disease must be inferred from the totality of existing laboratory, animal, dietary, clinical, and epidemiologic evidence. Such inferences must be based on the application of established principles for making determinations of the quality of scientific evidence. These principles emphasize the strength, consistency, specificity and biological credibility of diet-disease relationships. The stronger and more consistent, specific, and credible an association, the more convincing is evidence for causality.

Of special concern are changes in the dietary patterns and practices of Americans that appear to be related to chronic disease causation. Our information about these practices comes from two major sources:

Department of Agriculture (USDA) data on the quantities of foods and nutrients that are available for consumption by the population, and surveys of actual dietary intake from the USDA and this Department's National Center for Health Statistics (NCHS). Per capita disappearance data for the food supply have been recorded annually by the USDA since 1909. The first dietary intake surveys were conducted in 1965 and have continued periodically since then. Because not all of the food that is produced is actually eaten, the amounts given in per capita disappearance data on availability are usually larger than the amounts given in data on dietary intake. For these reasons, information on trends is imprecise and only broad generalizations can be made.

Despite these limitations, both long- and short-term trends are apparent in data from the USDA. These include:

- An overall increase in availability of commodity food fats and oils of 60 percent since 1910 and of nearly 22 percent since 1975. This trend is reflected in a 40 percent increase in availability of dietary fat and an increase in percent of total caloric availability from fat from 32 percent in 1910 to 42 percent in 1975, and to 43 percent in 1985. In addition, changes have occurred in specific sources of fat in the food supply. For example, from 1910 to 1985, animal fat availability decreased by 60 percent while vegetable fat availability increased 430 percent.

  Inconsistencies between USDA's disappearance data and dietary survey data frequently occur because one set measures food production while the other measures food intake. Dietary data indicate that from 1977 to 1985, intake of fat declined by 6 percent in men and women ages 19 to 50 and the percent of total calories obtained from fat declined from 41 to 36 percent in men and 37 percent in women of those ages.

- An overall decrease in availability of food cholesterol. From 1910 to 1945, cholesterol availability increased by 18 percent. After that, it declined. By 1975, it had declined by 19 percent to its current level of 480 mg per person per day. This trend is reflected in dietary intake figures that show a decline in daily cholesterol consumption from 511 to 435 mg in men ages 19 to 50 and from 345 to 304 in women from 1977 to 1985. Much of this decline is due to a reduction in availability of eggs that began to occur in the early 1950s and has continued to the present.
- An overall increase in intake of sugars and sweeteners. From 1910 to 1985, the availability of this food group increased by 70 percent; from 1975 to 1985, it increased by 22 percent. The availability of sucrose, common table sugar, decreased from 1975 to 1985 by 29 percent, but it has been replaced and overtaken by corn sweeteners which have greatly increased in availability during the past decade.
- An overall decline in total carbohydrate availability of 23 percent from 1910 to 1975. Since 1975, however, this trend has reversed and carbohydrate availability has increased by 9 percent. In 1910, the percent of total caloric intake from carbohydrate was 57 percent. In 1975, it was 48 percent. Because the availability of total calories has increased in the last decade, it had fallen to 46 percent by 1985. This trend results from an overall long-

term decline in availability of fruits, vegetables, potatoes, and grains that reversed and began to increase gradually in the late 1960s. The trend is also reflected in dietary intake data that report an increase in percent of total calories from carbohydrates from 41 to 45 percent in men and from 41 percent to 47 percent in women ages 19 to 50 from 1977 to 1985.

- An overall increase of 20 percent in availability of alcoholic beverages since 1965. Within the past ten years, however, overall per capita consumption has leveled off. This has occurred as the result of a 15 percent reduction in intake of distilled spirits but an increase in beer consumption of 8 percent and an increase in wine consumption of almost 20 percent.
- An overall increase in availability and intake of nearly all vitamins and minerals tracked by the USDA. The one exception is magnesium which has decreased in availability by 70 percent from 1910 to 1975, but which increased in availability by 3 percent between 1975 and 1985; its intake also increased during that time.

At this point I would like to give some examples of the ways in which these dietary patterns affect the development of chronic disease conditions.

Coronary heart disease. Although deaths from coronary heart disease (CHD) are declining in this country, this condition still accounts for more deaths annually (500,000) than any other cause, including cancer. The cost of illness and death from CHD was estimated at $49 billion in 1985 for direct health care expenditures and lost productivity. The major risk factors for CHD are high blood pressure, cigarette smoking, and high blood cholesterol. Diet affects two of these factors—blood pressure and blood cholesterol. Blood cholesterol is of special concern. At least 50 to 60 percent of adult Americans are above the level identified for increased risk, i.e., 180 to 200 mg/dl, and 25 percent are at levels posing substantially higher risk.

Dietary factors associated with increasing the risk of CHD are fat (particularly saturated fat), cholesterol, and energy imbalance leading to obesity. The relationship of dietary saturated fat to blood cholesterol levels and to CHD is supported by extensive and highly consistent animal, epidemiologic, metabolic, and clinical evidence. The evidence that relates dietary cholesterol to blood cholesterol and to CHD risk is less striking than that for saturated fat, though many foods high in cholesterol are also high in fat. Evidence indicates that obesity is associated with elevations in blood cholesterol levels and other CHD risk factors; it is also a significant independent predictor of heart disease incidence, especially in women and in persons under age 50. Although light-to-moderate alcohol consumption has been associated epidemiologically with reduced heart disease risk, the significance of its action is poorly understood. Consumption of alcohol causes other adverse health consequences that make avoidance of excess a worthwhile health goal.

High Blood Pressure. High blood pressure (hypertension) affects nearly 60 million Americans, of which 39 million are under the age of 65. Thirty eight percent of blacks are estimated to have high blood pressure compared to 29 percent of whites. This condition is a major risk factor both for CHD, the leading cause of death in the United States, and for stroke, which is the third most common cause of death.

Dietary factors that contribute to high blood pressure include obesity and excessive intake of sodium and alcohol. The National Research Council recommends 1.1 to 3.3 grams per day for safe and adequate sodium consumption but the average adult consumes 4 to 6 grams. Studies in patients with mild and moderate hypertension have demonstrated that achieving and maintaining recommended body weight, and reducing excessive intake of sodium and alcohol, can lower blood pressure and reduce the need for anti-hypertensive medications.

Obesity is strongly associated with high blood pressure. Blood pressure is reduced when weight is lost. Similarly, restriction of alcohol consumption to no more than moderate daily levels--one or two standard-size drinks--also has a beneficial effect. Evidence regarding the effects of increased dietary intake of potassium, calcium, magnesium, and fiber requires further confirmation before conclusions can be drawn.

Cancer. Cancer is the second leading cause of death in the United States. Its relationship to diet will be discussed in detail by Dr. Peter Greenwald this morning. The dietary factors that have been associated in epidemiological studies with either the development of cancer or its prevention are fat, calories, fiber, vitamin A, and alcohol. A role for vitamin C, vitamin E, selenium, animal protein, and salt- and smoke-cured foods (in the United States) has also been proposed but is supported by less extensive evidence.

Diabetes. Diabetes affects nearly 11 million people and is the seventh leading cause of death (35,000/year). Obesity greatly increases the risk of developing Type II (noninsulin-dependent) diabetes and studies indicate substantial benefits from weight loss. It is also likely that reduction of calories, fat, salt, alcohol, and simple sugars—and increased intake of foods containing starch and fiber--are beneficial in treatment of this condition.

Current research suggests that diets low in fat and cholesterol, salt, and protein can reduce the risk of the long-term cardiovascular, hypertensive, and renal complications of diabetes, respectively, and that alcohol should be avoided by patients with insulin-induced hypoglycemia, neuropathy, or poor metabolic control. Research on dietary management of Type I (insulin-dependent) diabetes emphasizes the importance of weight maintenance, avoidance of hypoglycemia, and metabolic control by coordinating caloric intake and expenditure with the schedule of insulin intake.

Obesity. Obesity increases the risk of high blood pressure, diabetes, and high blood cholesterol, and therefore contributes to the premature mortality associated with these conditions and those for which they in turn are risk factors--heart disease, stroke, and renal disease. In addition, obesity raises the risk for gallbladder disease and for certain cancers. Obesity may well be the most prevalent diet-related problem in the United States. It affects 34 million adults ages 20 to 74 years, with the highest rates observed among minority groups and the poor.

Overweight occurs when excess calories are consumed in relation to those expended for individual metabolic requirements. The major source of calories is dietary fat (which contains more calories per gram than any other source of energy). Alcohol is also relatively high in calories, although its relationship to obesity is not well defined. Sugar should be used only sparingly by individuals seeking to maintain desirable body weight.

Evidence indicates that exercise burns calories, increases the proportion of lean to fat body tissue, and raises the metabolic rate. These effects demonstrate the importance of increased overall levels of physical activity among the general population as a means to achieve and to maintain desirable body weights.

Osteoporosis. Osteoporosis afflicts 15 to 20 million Americans, causing an estimated 1.3 million fractures annually of the vertebrae, hips, forearms, and other bones in people older than 45 years. By age 90, one-third of women and one-sixth of men will have suffered hip fractures, leading to death in 12 to 20 percent of these cases and long-term nursing home care for many of those who survive. The total direct and indirect costs of osteoporosis were estimated to be $6.1 billion in 1983.

Dietary factors of particular concern in the occurrence of osteoporosis are calcium, phosphate, vitamin D (and its active hormonal form calcitriol), protein, calories, and alcohol. Other lifestyle factors, such as cigarette smoking and reduced exercise, also adversely affect bone mass. Research has not yet identified the ideal level of calcium intake for development of peak bone mass, however, nor has it yet been established whether increased calcium intake will prevent osteoporosis. However, studies show that average calcium intake is below recommended levels for teenagers, adult women, and the elderly.

Dental diseases. Among the leading health problems in this country, dental disorders rank second in direct costs and expenditures. Dietary factors of principal interest in dental diseases are sugars and fluoride. Frequent consumption of sugars, especially sucrose, is well established as a factor that promotes formation of dental plaque, the key predisposing cause of both dental caries and periodontal disease. The role of fluoride in prevention of tooth decay is also well established from animal studies and from human epidemiology and clinical trials. These studies demonstrate the decline of dental caries in the United States. Evidence on the role of other nutrients such as vitamin A, vitamin C, calcium, and phosphate is less certain.

Kidney Disease. About 19,000 people in the United States are affected by end-stage renal disease each year. The condition occurs more commonly among black than among white Americans. About 70,000 patients undergo maintenance hemodialysis two or three times a week and another 11,000 patients undergo continuous ambulatory peritoneal dialysis. The estimated annual costs of these treatments are well over $2 billion.

The nutrients identified as of particular interest in the occurrence of renal disease are protein, phosphate, and fat. Studies in patients with chronic renal disease suggest that diets low in protein and low in phosphate can retard the progression of disease, but the evidence for a role in prevention is less compelling.

In summary, there is evidence that nutritional factors such as fat and alcohol, for example, increase the risk for multiple chronic disease conditions. Other factors appear to offer protection against multiple conditions. Taken together, these observations suggest the potential value of an overall change in dietary pattern from one based on foods high in energy, fat, cholesterol, sugar, salt, and alcohol, to one that contains greater amounts of foods containing protective factors such as fiber, vitamins, and minerals. They also suggest that a lifestyle involving more regular exercise in order to improve and maintain an appropriate body weight would also produce multiple health benefits.

The Department of Health and Human Services is responsible for developing information on these relationships and for promoting a more healthful diet in several key ways:

- Basic research on diet and disease. Expenditures for biomedical and behavioral nutrition and training research at the National Institutes of Health were nearly $213 million in FY 1968. The total FY 1986 expenditures for human nutrition research and training by the Public Health Service amounted to $231 million.
- Consumer information on food labels, as regulated by the Food and Drug Administration (FDA). Currently under discussion is a proposal by the FDA to permit health claims on package labels.
- Surveys of dietary intake and of disease prevalence. The National Center for Health Statistics is currently conducting field tests for the third National Health and Nutrition Examination Survey.
- Initiatives of Specific Institutes of the National Institutes of Health (NHLBI, NCI, NIDDK) to reduce diet-related risk factors among the population. The National Cholesterol Education Program of NHLBI is the most recent example.
- Cooperative efforts with State health departments to develop chronic disease surveillance and prevention programs (CDC).

- Development of dietary guidance information.
- Development of nutrition and health objectives for the Nation through 1990 and the year 2000 objectives.

I would like to discuss this last point in some detail. Current Federal recommendations are supported by an increasing scientific and professional consensus on the type of diet that best promotes health and prevents disease. It is important to understand how these recommendations have shifted in the past decade.

Until the mid-1970s, an adequate diet was defined as one that contains energy-producing and essential nutrients--amino acids, vitamins, and minerals--sufficient to prevent deficiency diseases. In the mid-1970s, however, the focus of national policy objectives expanded to encompass the role of overconsumption of fat, sugar, salt, cholesterol, and alcohol in chronic disease causation. The increasing scientific evidence on these relationships has led to the view that dietary adequacy should be redefined to include the proportions of dietary factors associated with prevention of chronic--rather than deficiency--diseases.

This new perspective was reflected in the 1977 report, Dietary Goals for the United States, produced by the Senate Select Committee on Nutrition and Human Needs. It was supported in 1979 by this Department's Healthy People: the Surgeon General's Report on Health Promotion and Disease Prevention which recommended reduced intake of sugar, fat, salt, cholesterol, and alcohol, and maintenance of ideal body weight. These recommendations were expanded by the 1980 publication, Nutrition and Your Health: Dietary Guidelines for Americans, (revised 1985) jointly issued by the Departments of Agriculture and of Health and Human Services. They include the following principles:

- Eat a variety of foods.
- Maintain desirable weight.
- Avoid too much fat, saturated fat, and cholesterol.
- Eat foods with adequate starch and fiber.
- Avoid too much sugar.
- Avoid too much sodium.
- If you drink alcoholic beverages, do so in moderation.

These common principles have been emphasized more recently in development of the nutrition component of the 1990 Health Objectives for the Nation and in dietary recommendations to reduce disease risk set forth by the National Heart, Lung, and Blood Institute and National Cancer Institute.

Most recently, the Department has sponsored the development of a major, comprehensive review of the research information bearing on diet-disease relationships. The first Surgeon General's Report on Nutrition and Health will examine the evidence that links present dietary patterns to disease prevalence and, on the basis of that review, explore the implications of current knowledge for dietary guidance and education, nutrition programs and services, and nutrition research and surveillance. This report is approaching its last stages of review and should represent the consensus of the Public Health Service on the potential health benefits of dietary changes. We believe that this report will provide ample documentation for the importance of nutrition to health and will establish a foundation for Federal policy in this area for the future.

Mr. Chairman, I appreciate your interest and that of your committee in this area and I thank you for the opportunity to speak with you today.

STATEMENT

OF

PETER GREENWALD, M.D., DR.P.H.

INTRODUCTION

I am Peter Greenwald, Director of the Division of Cancer Prevention and Control, of the National Cancer Institute (NCI). My division is one of four research divisions of the NCI and is responsible for supporting a national effort to develop and apply knowledge and methods of cancer prevention and control. To accomplish this, the program focuses on the validation, evaluation and demonstration of methods for cancer prevention, screening and detection. The link between research, technology transfer and cancer control surveillance is emphasized in order to effect significant reductions in cancer incidence, mortality and morbidity, and increase cancer survival rates.

Nutrition-related research has been a formal focus of the NCI since the passage of P.L. 93-352 in 1974, which amended the National Cancer Act by encouraging the exploration of the role of nutrition in the etiology and treatment of cancer. Subsequently, the NCI established the Diet, Nutrition and Cancer Program (DNCP), now coordinated by the Division of Cancer Prevention and Control.

DIET, NUTRITION AND CANCER PROGRAM

Cancer develops through multiple steps, including the two main steps of initiation and promotion. It was not until the early 1980's, however that we were able to mount a major program on diet and cancer prevention. Before then research had not provided enough information. The first step, initiation, is defined as the consequence of the initial interaction of a cell with a cancer causing agent. It is almost inevitable that at some time everyone is so exposed. The cell is irreversibly altered and now contains cells that are precursors to tumor cells. If the next step, promotion, occurs, the development of a tumor will progress. We now know that initiation is irreversible but does not inevitably lead to cancer without exposure to promoters. Epidemiologic and evidence in laboratory animals that promotion can be reversed by modulating certain substances, including dietary components, is the scientific basis of cancer prevention research.

The Diet, Nutrition and Cancer Program explores the many facets of the relationship between diet and cancer. The research resources to focus on these factors and the mechanisms involved were put in place over the past several years and exploration has begun. The great potential to reduce cancer incidence and subsequent mortality by intervening in the promotion stage make this area of research a vital component of the National Cancer Program.

Basic and prospective clinical studies are at the core of the validation process to identify the most promising dietary agents to reduce cancer incidence and mortality. Chemoprevention studies, in animal and human models, determine whether introduction of synthetic or natural micronutrients (such as vitamins and minerals) can lower cancer incidence. The NCI is supporting 24 chemoprevention clinical trials. Some examples of current projects are:

- A randomized trial of aspirin and beta-carotene in U.S. physicians;
- Breast cancer prevention with a synthetic retinoid (HPR);
- Chemoprevention of cervical cancer;
- Nutritional prevention of polyps (considered cancer precursors) in the large bowel;
- Pilot clinical trial of beta-carotene and Vitamin E to prevent lung cancer;
- Chemoprevention of skin cancer by various forms of vitamin A and synthetic derivatives.

Dietary modification studies focus on the role of macronutrients (such as protein, fat, and carbohydrates) and specific food groups in cancer risk. Toward this end program resources are earmarked to develop the necessary methods and logistics to achieve and maintain dietary change for cancer risk reduction, to track and assess dietary change, to develop biological markers to measure compliance to particular dietary regimens, and to search for interim biological markers predictive of cancer.

As our knowledge about cancer has grown, it has become increasingly apparent that lifestyle factors are associated with cancer development. Tobacco use, dietary factors and alcohol abuse are among the most important. We know now that changes in behaviors associated with these risk factors, plus aggressive application of current screening and treatment methods, could significantly reduce cancer incidence and mortality in the years to come. These changes could have significant impact on public health because cancer is the second leading cause of death in the United States. We have estimated 483,000 cancer deaths will have occurred in 1987.

Mr. Chairman, I welcome the opportunity to present a summary of our knowledge about the association of dietary factors and cancer. My remarks will highlight the scientific basis of NCI's current six dietary guidelines to reduce cancer risk and the plans to fill many gaps that still can be found in our understanding of the diet and cancer relationship. As you requested, I will give special emphasis to the relationship between dietary fiber and the prevention of cancer.

NCI DIETARY GUIDELINES

NCI's current dietary guidance, based on reviews of the literature conducted by the National Academy of Sciences (NAS) and by the National Cancer Institute (NCI), emphasizes principles endorsed by a number of scientific bodies (Tables 1 and 2), including the USDA/DHHS Dietary Guidelines for Americans. The NCI fiber guidance also reflects a broad consensus of scientific opinion (Table 2):

- Increase fiber intake to 20-30 grams per day, with an upper limit of 35 grams.
- Reduce fat intake to 30 percent or less of calories.
- Include a variety of vegetables and fruits in the daily diet.

- Avoid obesity.
- Consume alcoholic beverages in moderation, if at all.
- Minimize consumption of salt-cured, salt-pickled and smoked foods.

In general, diet and cancer studies have indicated that diets low in fat, rich in fiber-containing foods, and rich in fruits and vegetables are associated with lower risks of a number of cancers. Dietary factors are associated with cancers of the gastrointestinal tract (esophagus, stomach, colon, rectum), and the liver, and some sex and hormone-linked cancers (breast, prostate, ovaries, and endometrium). They also may be related to cancers of the respiratory system and urinary bladder. These guidelines are the product of our current understanding of the link between nutrition and cancer which has been under investigation since the 1940's. Although the evidence linking diet and cancer risk is not yet conclusive, it is sufficient to dictate that we advise the public as to our current knowledge.

I would like to note that the NCI is not a regulatory agency and the Institute's dietary guidance is not related to the regulation of health claims in the labeling and marketing of food products, a process regulated by the Food and Drug Administration.

HISTORY

Although scientists had been investigating diet's role in cancer development for many years, an impetus was given to this research in the 1940's when an examination of insurance records by Tannenbaum showed that the risk of cancer was somewhat higher for overweight people than for normal weight or underweight people. This prompted Tannenbaum to study the diet and cancer link in animals. He found two things: 1) that underfeeding resulted in a lower incidence of certain tumors and 2) that high fat diets favored development of mammary tumors in rats.

Only in recent decades have there been attempts to relate findings of diet and cancer in animal studies to cancer mortality in human populations. In the 1960's and 1970's, interest in the role of nutrition in human cancer began to grow. Cancer rates were found to vary widely in different countries around the world. Observations about differences in rates of various cancers in defined populations, especially among migrant groups as compared to populations in their country of origin, led investigators to believe that environmental factors, especially diet, might play a role in the cancer experience of human populations. For example, studies of Japanese women who migrate to the United States have shown that these women experience a higher incidence of breast cancer.

The most comprehensive review of the diet and cancer link to date comes from Doll and Peto (1981). They estimated that approximately 35 percent of cancer deaths may be related to dietary components, with the possible range of effect being 10 to 70 percent. Although these estimates are not considered definitive, they point to the need for research to test the effectiveness of dietary interventions in reducing cancer mortality for particular cancers. Even using the most conservative estimates, dietary change has the potential to have a significant impact on cancer rates in the United States (Figure 1). With the exception of leukemia, nine of the leading cancers may be associated, positively or negatively with diet. These cancers account for 77 percent of cancer deaths.

A 1982 National Academy of Sciences report commissioned by the NCI, concluded that "cancers of most major sites are influenced by dietary patterns." Supported by the National Academy of Sciences report and its own review of the evidence, NCI has accelerated its research efforts on diet and cancer along the lines suggested by the Academy.

FIBER AND CANCER

Americans currently eat about 11 grams of fiber per day (Lanza, 1987). NCI recommends that we consume between 20 and 30 grams of fiber daily from a variety of fiber-rich foods such as vegetables, fruit, and whole grains. An upper limit of 35 grams daily is suggested to avoid any possible problems with mineral absorption.

The NCI's guidance to increase fiber intake is consistent with the recommendations of other scientific bodies. For example, the 1982 recommendation of the National Academy of Sciences Committee on Diet, Nutrition and Cancer was as follows. "The committee emphasizes the importance of including fruits, vegetables, and whole grain cereal products in the daily diet." (NAS, 1982) The 1985 Report of the Expert Advisory Committee on Dietary Fibre to the Health Protection Branch, Health and Welfare Canada also coincides with the NCI message. "The Committee recommended that, based on the average intakes found in the Nutrition Canada Survey..., the adult Canadian population at least double its intake of dietary fibres. The increase can be achieved by selecting a variety of foods containing 'moderate' to 'very high' amounts of dietary fibres and without supplements." (Health and Welfare Canada, 1985) As recently as 1987 a report prepared for the Food and Drug Administration based on the work of an expert panel made similar recommendations. "The Expert Panel recommended the consumption of a wide variety of whole-grain products, fruits, and vegetables, leading to a dietary fiber intake range of 20-35 g/d for the healthy, adult population." (Federation of American Societies for Experimental Biology, 1987)

Today I will review the major types of studies that have been performed to elucidate the role of fiber in cancer onset. My remarks will focus on the strength of the association, the consistency of findings and the considerations that sometimes make these investigations difficult to perform and to interpret.

Epidemiologic Studies

Epidemiology is "the study of the distribution and determinants of health-related states and events in populations, and the application of this study to control of health problems." (Last, 1983) Observations about the fiber and cancer relationship exemplify the contribution of epidemiology to our knowledge of the influence of environment on disease. Such studies allow us to formulate testable hypotheses based on observed associations.

Epidemiologic studies are generally classified as descriptive (ecological), case-control (retrospective) and cohort (retrospective or prospective) studies. Traditionally, epidemiologists have felt that case-control and cohort studies have greater significance and power than ecologic studies because conclusions are based on use of data from individuals, rather than population averages. However, there are major difficulties in seeing a true association if the range of variation in exposure (e.g., food groups or nutrients) is narrow, as occurs in many case-control or cohort studies of dietary factors. Ecologic studies permit analysis of a great many as well as a wide variety of diets. Especially in international studies, these types of studies can identify dietary associations that cannot be observed in case-control or cohort studies.

Ecologic studies provide for an examination of the influence of dietary changes over long periods of time, a critical issue in dietary exposure and cancer development. We are able to review critically the consistency of numerous large-scale ecologic studies across geographic, ethnic, gender and genetic boundaries.

In ecologic studies, cancer rates of various populations may be correlated with data on food disappearance, dietary surveys or blood chemistries. This type of study has been used to generate hypotheses about dietary factors related to cancer risk, especially from international comparisons and migrated populations. Another useful approach is to measure metabolic or biochemical changes that are associated with cancer. For example, circulating hormones, fecal bile acids, or other fecal constituents may be analyzed, and correlated with dietary intake and cancer incidence. (Reddy et al., 1980)

Correlation studies frequently rely on per capita consumption data, not individual intake, and tend to focus on a mortality end-point, rather than cancer incidence. It is important to be cognizant of these details when comparing different studies and study types. For example, inconsistencies in the literature might be attributed to differences in the association of fiber with cancer incidence compared to cancer death or mortality rates.

Ecologic studies are sometimes criticized because the two populations may differ in many factors (e.g., genetics, pollutant exposure, employment, weather) in addition to the factor under study. It may be that one or more of these factors actually account for observed differences in disease outcomes. Ecologic study data are generally from a specific point in time, a potential limitation in cancer etiology research. While ecologic studies are sometimes considered less powerful and useful than case-control and cohort studies, the data allow multiple comparisons that permit relatively inexpensive, rapid testing and generation of hypotheses. Consistency among correlations from many different studies strengthens the argument for a cause and effect relationship. (United States Department of Health and Human Services, 1982) Information on individuals also can be used in ecologic studies when the data are available, as from the National Health and Nutrition Examination Surveys (NHANES) in the United States. (McDowell et al., 1981)

The NCI has reviewed 42 epidemiologic studies published during the period from 1970-1987. Thirty-three of these studies identified an inverse or protective association between dietary fiber, fiber-rich diets or other measures of fiber consumption, and the risk of colon cancer. Six studies showed no association or were considered equivocal, and three reported a direct or promotive association with colon cancer (Table 3). A critical review of the major published epidemiologic investigations of fiber and colon cancer was published by NCI in 1986. This review found consistent evidence of a protective role for fiber in colon cancer.

Six out of seven large-scale, international correlation studies (Table 4) report lower cancer rates in populations eating a high fiber diet. Six of seven within-country studies comparing population subgroups (Table 5) found a protective effect. Other evidence supporting a protective role for fiber in colon cancer comes from metabolic epidemiology studies. These studies (Table 6) involve assessments of both eating patterns and metabolic data. Six of seven metabolic epidemiology studies show an inverse or protective effect for high fiber. Finally, three time-trend studies report protective effects for fiber.

In case-control studies, individual cases having the disease of interest are selected. They are compared to persons who do not have the disease, the controls. The cases and controls are compared with respect to present or past exposure to hypothesized risk factors. Exposure can refer to specific dietary components, history of other disease, genetic constitution, or specific biochemical indices (e.g., hypercholesterolemia). If cases are found to have greater proportions of individuals with the hypothesized risk factor, the hypothesis is strengthened. The risk is often expressed as a relative odds, or odds ratio, that reflects the proportion of cases with the risk factor compared to the controls.

As I have previously mentioned, major difficulties exist in seeing a true association in case-control studies if the range of exposure (e.g., food groups or nutrients) is narrow, as is often true in defined populations. For example, if the cases and controls are drawn from a population that is homogeneous in food or nutrient intake, differences between cases and controls may not be large enough to be seen. The amount of potentially beneficial food constituent ingested by most of the population may be insufficient to result in an observable benefit. It is also possible that the measure of intake, such as the dietary questionnaire, is not sufficiently sensitive to accurately assess diet quality, especially if the time period in question is ten to twenty years in the past.

Seventeen of the 42 epidemiologic studies received by NCI that assess the role of dietary fiber and cancer are case-controlled studies. Eleven of these show an inverse or protective association, three show no association, and three report a positive association (Table 7).

Although the mechanisms are not fully understood, fat may be included in the promotion of colon cancer by increasing the amount of bile acids in the colon. Colonic bacteria may convert these bile acids to secondary bile acids that are known tumor promoters in animals. In addition, various heterocyclic amines which are known animal carcinogens are found in some cooked foods and mutagens such as fecapentaenes have been found in human feces. Fiber is postulated to reduce the adverse effects of mutagens and carcinogens through several mechanisms, including dilution, decreased transit time, alterations in the metabolism of fecal bacteria, chemical binding, and reduced fecal pH. These types of changes have been demonstrated in several laboratory studies. These concepts provide a plausible explanation of the mechanisms by which fiber may protect against colon cancer.

Taken together, the preponderance and diversity of epidemiologic studies, including different populations consuming varied and distinctive diets, reveal a common trend for fiber as a protective factor in colon cancer. The weight of the evidence supports the relationship between colon cancer and dietary fiber. The large differences in incidence between both immigrant and general populations in the United States as compared to populations in the countries of origin of immigrant groups strongly suggest that these differences are chiefly lifestyle or environmental rather than genetic, with diet the suspect factor. Correlation studies suggest a high level of dietary fiber as protective against the typical Western high fat diet. These inferences are largely supported by animal studies.

Although there is substantial support for the fiber hypothesis, there are many unanswered research questions. For example, the 1982 NAS Report on Diet, Nutrition and Cancer noted that more needs to be learned about the specific role of fiber in colon cancer and the effects of specific components of fiber. Foods high in dietary fiber also contain other dietary factors with which fiber may interact. The chemistry and function of various types of fiber and their interactions with other dietary components need more study.

Colon cancer may have numerous etiologic determinants. The interaction of diet and other factors remains to be studied. Despite gaps in our knowledge, the existing evidence cannot be set aside to await absolute answers. As Hill stated, "All scientific work is liable to be upset or modified by advancing knowledge. That does not confer upon us a freedom to ignore the knowledge we already have, or to postpone the action that it appears to demand at a given time." (Hill, 1983)

The exigencies of public health problems require prudent action whenever reasonable evidence is available despite imperfect knowledge. Therefore, the National Cancer Institute has recommended that Americans increase their current fiber intake by increasing the daily consumption of fruits, vegetables, legumes and whole grain cereal and bread products.

It is important to note that NCI's guideline addresses food sources of fiber rather than fiber supplements. Studies world-wide demonstrate the association between low colon cancer rates and diets rich in fiber from whole grains, fruits and vegetables. No direct evidence yet supports the value of fiber supplements. Furthermore, knowledgeable scientists consider the guideline virtually risk-free and suitable for the general public.

FAT AND CANCER

Americans consume somewhere in the range of 36 and 40 percent of their daily calories in the form of fat. NCI recommends that we lower the proportion of fat in our diets to 30 percent of calories or less. This recommendation is consistent with that of other national scientific consensus groups concerned with nutrition and chronic disease prevention, including: the National Academy of Sciences, the American Cancer Society, and the American Heart Association (Table 1). Scientists have more compelling evidence for an association between certain cancers and fat than for any other dietary component. In general, studies indicate that a high fat intake promotes carcinogenesis, although it is not yet clear whether any specific type of fat is responsible.

The Diet, Nutrition and Cancer Report of the National Academy of Sciences (NAS, 1982), concluded that of all the dietary components it studied, the combined epidemiological and experimental evidence was most suggestive for a causal relationship between fat intake and the occurrence of cancer. Both epidemiological studies and experiments in animals provide convincing evidence that increasing the intake of total fat increases the incidence of cancer at certain sites, particularly the breast and colon, and, conversely, that the risk is lower with lower intakes of fat.

International epidemiologic studies report the strongest association between high fat intake and the incidence of breast, colon and prostate cancers. In 1975, Carroll and Khor showed that industrialized countries with high fat diets, such as the United States, Australia and northern European nations, have some of the highest mortality rates in the world for these cancers.

Asian countries, including Japan, have traditionally favored low fat diets. They also have traditionally had a low incidence of most Western cancers. However, as the Japanese diet has become more Westernized, including a doubling of dietary fat between 1955-75, Japanese cancer rates have risen. (Hirayama, 1978)

Studies of migrant populations show similar results. As the 1978 study by Wynder and Hirayama shows, when Japanese migrants in Hawaii adopted the higher fat diet of their new country, breast and colon cancer incidence was higher than that of native Japanese.

As a result of this body of literature, the NCI funded a feasibility study on the relationship between fat and breast cancer, entitled the Women's Health Trial (WHT). The pilot study for the Women's Health Trial began in 1984. From its inception, the WHT was monitored by a Policy Advisory Committee. The National

Cancer Advisory Board also requested that its members be kept informed and that the trial not be fully implemented without the NCAB's approval.

The final recommendation of all the NCI advisory bodies involved was that the full-scale study not be pursued at this time. Major concerns included the following: Dissension in the scientific community over whether fat alone or fat in combination with calories is the critical variable promoting breast cancer; the lack of a biochemical marker to validate adherence to a low fat diet; an estimate that if the rate of reduction in breast cancer incidence was 25 percent rather than 50 percent in the intervention group, then the statistical power would be too low to allow definitive answers; concern that even if fat were an important determinant that dietary change might have to occur earlier in life rather than in the middle-aged group targeted by the study; and the concern that the nation-wide trend toward lower fat intake could obscure any observable difference between the experimental and control groups.

NCI will provide some additional support to further work on study design, continue work on adherence markers, and collect and store blood samples from participants in the Women's Health Trial for future studies. In addition, participants will receive useful materials to help them maintain a low fat diet, if they so choose.

There is enough information and sufficient scientific agreement for the NCI to stand by its dietary guideline to reduce fat intake to 30 percent or less of calories. This public health message is appropriate in the context of the NCI's general dietary guidance. While the relationship between fat and calories is complex and requires further research, we do know that fat is a dense source of calories providing more than twice as many calories per gram as carbohydrate or protein. Thus, reducing fat intake is an efficient way of reducing calories as well as fatty acid intake. Further research may provide needed insight into the role of fat versus the role of calories in cancer risk, but enough is known to substantiate the need to reduce both.

FRUIT, VEGETABLES AND CANCER

A number of components in fruits and vegetables have been demonstrated to have protective effects against several cancers. These include vitamins A, C and E, carotenoids, a few minerals, fiber, and some non-nutritive substances. These elements may act either alone or together. A number of epidemiologic and laboratory studies show that overall cancer incidence decreases as consumption of vegetables increases.

Carotenoids, found in dark green and yellow-orange vegetables, may reduce the risk of many epithelial cancers, such as cancers of the lung and esophagus. (Hennekens, 1986) In a large cohort study of male employees of Western Electric, pro-vitamin A carotenoid intake was strongly linked to lower lung cancer incidence - especially among smokers. (Shekelle, 1981) Male chronic smokers who have a low daily carotenoid intake have a seven times greater chance of developing lung cancer than those who have a high daily carotenoid intake. This is exciting information, but it should not be a reason for smokers to be reassured. Smoking cessation is still the best way to avoid a great many cancers. Smoking is a cause or a contributor to a wide range of specific cancers, especially those of the lung, mouth, larynx, esophagus, pancreas, kidney and bladder. In addition, smoking may be associated with cancers of the stomach, liver and cervix.

It is difficult to assess whether preformed vitamin A, beta-carotene or other carotenoids has a greater protective effect on cancer development. NCI is currently sponsoring numerous chemoprevention trials using beta-carotene, vitamin A and synthetic vitamin A analogs to help answer this question. This area of work emerges out of the basic research performed by NCI scientists who discovered evidence that retinoids suppress carcinogenesis. This sequence from basic research to clinical studies is an example of the bridge between basic and applied research at NCI.

Eating certain classes of vegetables or fruits may also help to reduce cancer risk. Cruciferous vegetables, including cabbage, cauliflower, kale, broccoli, turnips, watercress, radishes and

Brussel sprouts, are one such class of vegetables. Some epidemiologic studies show that cruciferous vegetables inhibit gastrointestinal and colon cancers. These vegetables contain other non-nutrient substances that may have cancer-inhibiting properties such as indoles and isothiocyanates. These protective factors may act alone or together with other substances. Numerous studies are now underway evaluating various chemical components of vegetables and their role in cancer risk.

OBESITY AND CANCER

Obesity has long been associated with a number of diseases, including diabetes and cardiovascular problems. Obesity and a high calorie diet have now been linked to greater risk of cancer, as well. A recent review of 36 epidemiologic studies examined associations between body weight and various cancers. (Albanes, 1987) Twenty-one of these studies indicated increased risk with increased body weight and cancer, especially cancers of the breast and endometrium. In 1979, Lew and Garfinkel reported on a large cohort study exploring a wide range of tumor types. Their study showed an increased risk of cancer associated with increased relative body weight. (Lew and Garfinkel, 1979) The lowest overall cancer mortality for men was seen in those who were between 10 percent below to 20 percent above the average weight for their age and height. The lowest risk for women was seen in those who were more than 20 percent below or 10 percent above average weight. When nonsmokers were analyzed, they were found to have one-half the risk of heavy smokers in the low weight categories. There was a linear relationship between relative body weight and cancer in the nonsmokers, but almost twice the increased risk for smokers in all weight categories.

Mortality rates for individuals 40 percent or more overweight have been calculated as 1.33 for men and 1.55 for women. (Garfinkel, 1985) In men, this relationship was statistically significant for cancers of the colon, rectum, and prostate, and in women for cancers of the breast, uterus, ovary and gallbladder. The relationship between caloric intake, fat intake and body weight are complex and require more study; nevertheless, most data suggest that reducing calorie intake and body weight may lead to decreases in many human cancers.

ALCOHOL AND CANCER

Drinking excessive amounts of alcohol has been linked to several types of cancer, including those of the head, neck and liver. Oral cancer risk is greatly increased if drinking is combined with cigarette smoking. (Rothman and Keller, 1972) Although heavy smoking alone increases the risk of oral cancer two or three times, the drinking smoker has an estimated 15-times greater risk than the non-drinking, non-smoker. In 1982, 75 percent of deaths from oral cancer were associated with the combination of cigarettes and alcohol. (Decker and Goldstein, 1982)

Excessive alcohol consumption is often accompanied by poor eating habits. For example, alcohol abusers frequently consume 25-50 percent of their total calories as alcohol. The combination of poor nutrition and heavy drinking has a synergistic effect on the risk of esophageal cancer. (Ziegler, 1981) Finally, alcohol has been implicated in the development of rectal and colon cancer in some studies, although overall findings are not consistent.

Two recent investigations into dietary aspects of breast cancer etiology led to very similar results with respect to alcohol consumption. A large cohort study (Willett, et al., 1987) and a 10-year follow-up study of over 7,000 women (Schatzkin, et al., 1987), revealed excess risks of breast cancer associated with light to moderate alcohol consumption. The relative risks were on the order of 1.5 to 2.0 for those women averaging one such drink per day, with some evidence that the risks are influenced especially by alcohol consumption at a relatively young age (under 35). Further studies are underway to determine whether the relationship between alcohol intake and breast cancer has causal significance.

SALT-CURED, PICKLED, SMOKED FOODS AND CANCER

We now know that certain food preparation or processing methods - salt-curing, salt-pickling, smoking, open-flame grilling - produce mutagens and carcinogens in foods, especially meats. These substances include nitrosamines and polycyclic aromatic hydrocarbons. N-nitroso compounds, including nitrosamines, have proved carcinogenic in animal studies. Nitrates and nitrites, which can be converted to nitrosamines in the body, are used to preserve many foods, including many oriental-pickled foods.

In laboratory research, polycyclic aromatic hydrocarbons or PAHs induce cancers at many sites. Some cooking methods such as broiling at a very high temperature near an open flame allow PAHs to accumulate on the blackened food surface. These PAHs are similar to those found in cigarette smoke.

International epidemiologic surveys associate diets high in cured and smoked foods with an increased incidence of gastric and esophageal cancers. Case-control studies support these surveys. In the United States, salt-cured, pickled and smoked foods may not be a significant public health problem as the incidence of gastric cancer continues to decrease. The rate of stomach cancer deaths has dropped 60 percent from the early part of the century.

RESEARCH NEEDS

The NCI is establishing an intramural laboratory for nutrition and cancer research. The laboratory will have three sections: 1) Basic Science - the elucidation of mechanisms for the role of diet in cancer initiation and prevention, 2) Nutritional Epidemiology - development of analytical methods and procedures to be used in large-scale population studies and, 3) Human Studies - controlled clinical and metabolic studies of dietary factors associated with cancer risk. This laboratory-based research is an adjunct to developing human research studies and provides information essential for conducting high quality controlled clinical trials. The laboratory will also provide NCI with the staff expertise to respond to questions arising in a rapidly advancing field. By taking a lead role in this type of research, the NCI will stimulate the scientific research community and enhance the quality of nutrition research. Collaboration and communication with other Federal agencies will be thorough, so that programs among various agencies can be complementary even though they may have objectives oriented to diseases other than cancer.

I would like to now summarize some of the most critical research needs for diet, nutrition and cancer:

- Mechanisms by which initiating or promoting events may be affected by specific types of dietary fat, fiber, alcohol, vitamin A or other vitamins or minerals;
- Interactions among dietary factors such as fat, fiber, calories and specific vitamins and minerals, that influence cancer risk;
- Development of biological markers to identify populations at increased risk for cancer;
- Development of biochemical and biological markers for monitoring dietary adherence;
- Identification of carcinogenic and mutagenic substances found in the U.S. food supply and their effects on cancer risk;

- Identification of eating patterns to reduce cancer risk;
- Development of public health measures effective in aiding the public to modify eating practices.

SUMMARY

The NCI has concluded that the weight of scientific evidence supports public dietary recommendations. Our conclusions are consistent with that of other national scientific consensus organizations. Although the evidence linking diet and cancer risk is not yet conclusive, prudence dictates that we advise the public as to our current knowledge.

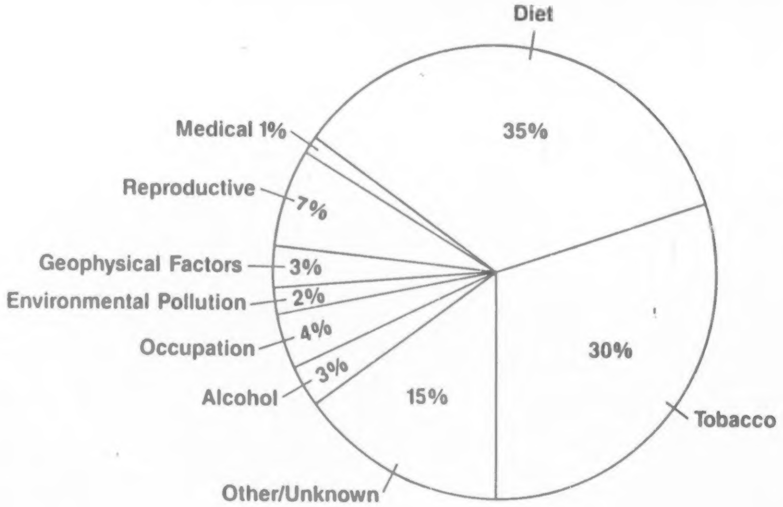
Currently, the Food and Nutrition Board of the National Academy of Sciences is preparing a new report on Diet and Health. We expect this report to be released towards the end of the year, or possibly early in 1989. It reviews the scientific basis of diet and chronic disease prevention recommendations. A Surgeon General's Report on Nutrition and Health is scheduled for release later this year. This report represents a review of current knowledge of nutrition and health. Once we obtain these reports, we plan to institute a comprehensive review of the NCI dietary guidelines to make sure they are consistent with these reviews. We will call upon an outside panel of scientific experts to help us in the review process. We are prepared to make changes or modifications in our present guidelines, as our knowledge becomes more refined. This flexibility is an example of our established policy to review regularly and update diet, nutrition and cancer prevention guidelines. As our understanding of the association between diet and cancer progresses, we will update our messages to the public.

Mr. Chairman and members of the Committee, I would be pleased to answer any questions you have at this time.

FIGURE 1

Research Shows:

The Largest Cancer Risk Factors Are the Ones We Can Control



Doll and Peto, 1981.

Table 1: Comparison of Dietary Guidelines for the American Public

	Fat	Fiber	Fruits and Vegetables	Obesity	Alcohol	Salt
NCI Dietary Guidelines 1987	Reduce fat intake to 30% or less of calories	Increase fiber intake to 20 to 30 grams not to exceed 35 grams	Include a variety of fruits and vegetables in the daily diet	Avoid obesity	Consume alcoholic beverages in moderation, if at all	Minimize consumption of salt-cured, salt-pickled, and smoked foods
American Cancer Society 1985 (69)	Cut down total fat intake	Eat more high fiber foods	Include foods rich in vitamins A and C; include cruciferous vegetables	Avoid obesity	Keep alcohol consumption moderate if you do drink	Keep consumption of salt-cured, smoked and nitrite-cured foods moderate
USDA/HHS 1985 "Dietary Guidelines for Americans" (70)	Avoid too much fat, saturated fat and cholesterol	Eat foods with adequate starch and fiber	Eat a variety of foods	Maintain desirable body weight	If you drink alcoholic beverages, do so in moderation	Avoid too much sodium
American Heart Association 1985 (71)	Total fat, 30% or less of calories; saturated fat, <10% of calories cholesterol, <100 mg/1,000 calories - not >300 mg/day	Include breads, cereals, pasta, and starchy vegetables containing natural complex carbohydrates	Include at least 3 servings/day of fruits and 3 servings/day of vegetables	Achieve and maintain desirable weight	If you drink, do so in moderation	Limit salt intake

TABLE 2

Dietary Fiber Recommendations

Dietary Goals 1977	Increase consumption of vegetables and fruits, and whole grains
National Academy of Sciences 1980	Consume each day ..... legumes, vegetables and fruits, and cereals and breads
National Academy of Sciences 1982	Include fruits, vegetables, and whole of grain cereal products in the daily diet
American Cancer Society 1984	Eat more high fiber foods, such as whole grain cereals, fruits and vegetables
Canada 1985	The adult Canadian population at least double its intake of dietary fibers
USDA/HHS 1985	Eat foods with adequate starch and fiber
American Heart Association 1985	Include at least 3 servings per day of fruits and 3 servings per day of vegetables
National Cancer Institute 1986	Eat a variety of foods which provide 20-30 grams of fiber per day
Federation of American Societies for Experimental Biology 1987	Healthy adults should eat whole grain products, fruits and vegetables, leading to 20-35 grams of fiber per day

Table 3 - Summary of epidemiologic studies of associations between dietary fiber and colon cancer

type of study	number studies	associations *		
		inverse	none	direct
international correlation	7	6	1	0
within country correlation	7	6	1	0
case-control	17	11	3	3
metabolic epidemiologic	7	6	1	0
cohort	1	1	0	0
time trend	3	3	0	0
total	42	33	6	3

* associations between fiber intake or fiber-rich diet levels and colon cancer

Table 4. Summary of international correlational studies of dietary fiber and colon cancer

authors	year	site	associations		
			inverse	none	direct
Drasar, Irving	1973	37 Countries	-	x	-
Irving, Drasar	1973	37 Countries	x(cereals)*	-	-
Armstrong, Doll	1975	32 Countries	x(cereals)*	-	-
Howell	1975	37 Countries	x(cereals, pulses) +	-	-
Knox	1977	20 Countries	x(fruit, veg., wheat)	-	-
Liu, et al.	1979	20 Countries	x(crude fiber)*	-	-
McKeown-Eyssen, Bright-See	1984	38 Countries	x(dietary fiber)	-	-

*adjustment for other food components removes association, but suitability of these adjustments is uncertain (see text).

+ no test for significance shown or not statistically significant.

Table 5. Summary of within country correlational studies of dietary fiber and colon cancer

authors	year	site	associations		
			inverse	none	direct
Bingham, et al.	1979	UK	x(pentosans)	-	-
Bingham, et al.	1985		x(cellulose, pectins)		
Lyon, Sorenson	1978	US	-	x	-
Enstrom	1980	Mormons	x(fruits, vegetables)*		
Malhotra	1977	India	x(fiber-rich diet)*	-	-
Rozen, et al.	1981	Israel	x(crude fiber)	-	-
Maisto, Bremner	1981	S. Africa	x(fiber-rich diet)*	-	-
Jensen	1983	Denmark SDA's	x(vegetarian diet)*	-	-

*no test for significance shown or not statistically significant.

Table 6. Summary of metabolic epidemiologic studies of dietary fiber and colon cancer

authors	year	site: subjects	signif. inverse correlation of fiber and colon cancer	signif. correlation metobolic effects of fiber and colon cancer
IARC	1977	rural Finns and urban Danes	yes, dietary fiber inversely correlates to four-fold differnece in colon cancer incidence	yes, greater stool weight in high fiber group
Reddy, et al.	1978	rural Finland, metro, NY	no, but Finns ate more whole grain cereals	yes, NY population had higher conc. secondary fecal bile acids, marker enzymes
Reddy, et al. Reddy, et al.	1980a 1980b	rural Finns; NY gen pop and SDA vegetarian	yes, Finns and SDA vegetarians had higher fiber intake than gen. population group	yes, NY gen. population group had higher fecal mutagens than others
Jensen, et al.	1982	rural and urban, Finland and Denmark	yes, inverse correlation of NSP to colon cancer incidence, all four populations	yes, high-incidence populations had lower fecal bulk and higher bile acid concentration than the low-incidence populations.
Domellof, et al.	1982	Sweden and US: intermediate and high risk groups	yes, intermediate-risk population ate more fiber	yes, intermediate-risk population had higher fecal weight and lower fecal sterol concentrations than high-risk group
Calkins, et al.	1984	US:SDA vegetarians and general population	yes, vegetarians had higher intake of lignin, cellulose, pectin than general population	yes, vegetarians had lower fecal cholesterol, secondary bile acids, and bile acid concentrations than general population group
Walker et al	1986	four South African populations	no difference in fiber intake (ADF)	difference in fecal pH

SDA= Seventh Day Adventist
NSP= Non-Starch Polysaccharide

Table 7. Associations and odds ratios of fiber-poor or combination diets and colon cancer incidence

author	year	site	associations (odds ratio and fiber source)		
			inverse	none	direct
Haenszel, et al.	1973	Hawaii	-	-	x
Bjelke	1974	Norway	x	-	-
Bjelke	1974	Minn.	x	-	-
Phillips	1975	US:SDA's	x*	-	-
Modan, et al.	1975	Isreal	x	-	-
Graham, et al.	1978	NY State	x(2.1 low veg)	-	-
Dales, et al.	1978	Bay Area	x(5.5 high fat x low veg)	-	-
Moskowitz, et al.	1979	Conn	-	x	-
Haenszel, et al.	1980	Japan	x(1.3 low veg)	-	-
Hunter	1980	US:Veteran	x*	-	-
Jain, et al. Howe, et al. Miller	1980 1982 1983	Canada	-	x	-
Martinez, et al.	1981	Puerto Rico	-	-	x(1.5 fiber, cereal)
Manousos, et al.	1983	Greece	x(8.0, high meat x low veg)	-	-
Pickle, et al.	1984	Nebraska	-	x	-
Potter, McMichael	1985	Australia	-	-	x(5.1 cereals)**
Tuyns	1986	Belgium	x(1.6 low veg)	-	-
Lyons et al	1987	US (Mormons)	x(crude fiber)		

*not statistically significant.
**Association disappears after adjustment for other dietary factors.

BACKGROUND PAPER FOR TESTIMONY ON THE ROLE OF DIETARY FACTORS IN THE INDUCTION OF CHRONIC DISEASE PROCESSES

Presented to Governmental Affairs Committee
Chair: Senator John Glenn
U.S. Senate
Washington, D.C.

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March 1, 1988
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PERSONAL

My name is T. Colin Campbell and I hold the position of Jacob Gould Schurman Professor of Nutritional Biochemistry in the Division of Nutritional Sciences at Cornell University in Ithaca, NY. My principal scientific interests during the past 25 years have been concerned with the effect of nutrition on cancer causation. My laboratory has investigated this relationship both in experimental animals and in human studies. In 1980-83, I was a co-author of the National Academy of Sciences report on diet, nutrition and cancer. At present, I also direct a series of collaborative studies on the causes of human disease in The Peoples Republic of China that includes as principal institutions the Chinese Academies of Preventive Medicine and Medical Sciences, the University of Oxford and Cornell University and, as participating institutions, about 22 research laboratories located in 5 countries. This project series attempts to understand why various cancers and other diseases are locally distributed in China.

OBJECTIVE

The objectives of this commentary are: (1) to consider the reliability of the scientific data base to support contemporary nutrition policies and recommendations, and (2) to identify appropriate governmental activities in furthering our understanding of the link between diet and disease.

RELIABILITY OF DATA

It is extremely difficult to know when experimental data are reliable enough to justify public recommendations on dietary practices. Debate on the question of the reliability and adequacy of data for policy-making purposes has continued for many years and will likely remain for as long as there are people who have different interests in the outcome. Some say that if an experimental observation is repeated a few times, it is sufficient for making public recommendations, especially if different investigators use different experimental procedures to arrive at the same conclusion. Others believe that an experimental observation must be supported by a biologically plausible mechanism before serious recommendations can be made. And still others might argue that until all attempts to make the underlying hypothesis fail are exhausted, only then can an observation be used in support of new dietary recommendations.

These are scientifically legitimate strategies which are used to build increasing strength in the experimental evidence. However, these tests of evidence should not be taken as irrefutable benchmarks of truth because that tends to over-specify and perhaps even to over-emphasize the certainty of the resulting recommendations and policies and institutionalizes consumer opinions and marketplace practices. Rather, it would be more appropriate that we understand that research investigation is more a quest for truth than a discovery of truth, particularly so when causes of disease are investigated.

When the objectives and methods of research investigation are misunderstood in this way, there is a tendency to reduce very complex biological relationships into very simple facts. Unfortunately, this is exactly the kind of misunderstanding which has occurred with increasing frequency in recent years in research investigations on dietary causes of disease. I have no doubt that this is the kind of misunderstanding which allows so much confusion and controversy when data are judged for policy-making purposes.

To appreciate the implications of this problem it is first necessary to fully comprehend the infinite complexity of our biological machine. We cannot just say this; we must understand. When this complexity is compounded as it is when food and its zillion constituents is matched against the dynamic development of disease, it then becomes very difficult to make sense of experimental studies focused on individual food constituents when the larger perspective is not fully understood. It's as if a map of your lawn could somehow be used to describe world geography. In this field, the search for biological truths has unfortunately become ever more focused and specialized, first upon individual groups of people, then upon individual tissues, individual cells, individual subcellular particles, individual molecules, and even upon individual atoms. Furthermore, such penetrating focus and specialization is made all the more possible with the sophistication of modern scientific instrumentation. We can now measure events far beyond our senses, then sort them out with ever more powerful computers. While such probing is absolutely essential to an eventual understanding of biological events, the data derived therefrom, when standing in isolation, cannot be used to construct dietary recommendations for large heterogeneous populations of people, particularly when considering the complexities of nutrition and disease interactions. And herein lies the frightening dilemma: the deeper we probe (in the absence of perspective), the less relevant becomes our research for making dietary recommendations. It is therefore not correct, as some have proposed, to insist on mechanism identity first before public recommendations are promulgated. If anything, the reverse is more likely to be true. It is possible for rather precise information on mechanisms to convey a sense of certainty for a specific cause at the exclusion of other causes. Moreover, a comprehensive and careful analysis of the larger perspective in context is likely to produce more useful information for policy recommendations than the probing of individual events in depth and out of context.

Here are some contemporary examples, briefly mentioned, where experimental focus has led to ill-informed health policy.

1. When it was first discovered over 30 years ago that polyunsaturated fatty acids, as generally found in plant oils, were effective in reducing serum cholesterol under some conditions, an industry was born and people responded by markedly increasing their intake of various plant-based unsaturated fats and decreasing their intake of animal based saturated fats. Now there are data showing that unsaturated fats, while being good for serum cholesterol, may be bad for cancer. At least in animal studies, certain kinds of these fats promote the development of tumors. Is it possible that these observations were

originally out of context? Evidence suggests that the best of both worlds could have been achieved simply by decreasing the consumption of both kinds of fats and increasing the consumption of a variety of plant produce.

2. Some years ago when serum cholesterol was found to be positively associated with the incidence of cardiovascular disease, it was figured that a reduction of dietary cholesterol could reduce serum cholesterol, but now we know that there is almost no relationship between the two. Yet we are still left with policies and marketplace practices that urge cholesterol labeling of food items, thereby encouraging people to believe that consuming fats and oils low in cholesterol is somehow a good thing to do. Could it be that the original observations were out of context? A reduction in serum cholesterol could also have been achieved simply by increasing the consumption of a variety of plant produce. In this way, the intakes of total fat and protein would be lower and dietary fiber would be higher and each of these constituents play far more significant roles than dietary cholesterol in reducing serum cholesterol.

3. In another example, contemporary emphasis is now given to dietary saturated fat as the chief determinant of serum cholesterol. As a consequence, low fat products high in protein, such as low fat skim milk and lean meat products are now recommended and are consumed in abundance. Although saturated fat intake may thereby be reduced, animal protein intake is increased. Unfortunately, we now know both from human and animal studies that animal protein increases serum cholesterol independently of saturated fat. Could it be that the focus on saturated fat as the chief determinant of serum cholesterol is out of context? Once again, an increased consumption of a variety of plant produce would have automatically reduced saturated fat intake while simultaneously changing a lot of other nutrient intakes in a favorable direction, thereby achieving the desired results without relying on the gimmickry of consuming high protein products like lean meats and low fat dairy products.

4. Vitamin A, as present in animal produce (i.e., retinoid derivatives) was, about 15 years ago, found to be protective against the development of certain cancers in experimental animal studies. That observation led to an intensive effort to chemically synthesize hundreds of various retinoid derivatives to find one that might be useful in the inhibition of cancer. It also led to the general impression, if not the general practice, that consuming vitamin A tablets might protect against cancer. We now know that higher levels of the animal form of vitamin A may actually increase, not decrease cancer risk. Is it possible that the original observation was out of context? Cancer risk reduction could have been better achieved simply by increasing the consumption of a variety of plant produce where the safer form of vitamin A, beta-carotene and its analogues, would be consumed at about the right levels.

5. Cabbages are highlighted in the American Cancer Society guidelines as being protective against cancer because of experimental data obtained from some narrowly focused studies on individual constituents found in the cabbage family. We also know that when tested under different experimental conditions, there are some cabbage family chemicals which increase tumor development in experimental animal studies. Is it possible that both sets of observations were out of context? Increasing the consumption of a variety of plant produce, including some cabbage with its higher dietary fiber, its lower fat, its higher vitamin C, etc., would avoid the consequences of both of these narrowly focused observations.

6. In one final example, we now hear that more high calcium foods such as dairy produce should be consumed to reduce the risk of osteoporosis; perhaps even calcium supplements are in order. However, we know that calcium intake from dairy produce is already very high in the U.S., providing about three-quarters of our calcium intake. Furthermore, we also know from the broad sweep of international studies that populations consuming a low level of dairy products have a lower, not higher incidence of

osteoporosis, so why should we want to increase still further the calcium intake from dairy products to reduce osteoporosis? Is it possible that a narrowly focused observation on calcium vs. osteoporosis, while ignoring the effects of other nutrients, is out of context? Once again, there is some impressive evidence showing that increasing the consumption of a variety of plant produce with its lower protein content actually reduces the incidence of osteoporosis because it is the high protein intake, not the low calcium intake that is likely to be the chief determinant of osteoporosis.

These examples are but six of dozens, perhaps hundreds, which could be used to illustrate the same point. The extraordinary number of diet books and special nutrient supplements now on the market attest to this mischief. When observations are taken out of context, marketplace gimmicks and ill-fated policies are the result.

By way of summary, these examples illustrate the following. First, investigations of single nutrients, single foods or single diseases out of context runs a very high risk of yielding information and policy also out of context. Second, when the etiology of each of these chronic degenerative diseases is considered in context, the evidence strongly suggests that increasing the consumption of a diet rich in plant produce will decrease risk of all chronic degenerative diseases. That is, when this recommendation is followed, the evidence strongly suggests that the reduced risk of one chronic degenerative disease will not be associated with an increased risk for another. And third, the foregoing recommendation is based primarily on evidence coming from a panoramic review (in various ways) of a rich diversity of experimental studies where information on single food constituents and single mechanisms is used to supplement rather than to dictate the strength of the evidence.

As an aside, this theme can also be used to advantage to better understand the results of Professor Willett and his colleagues on dietary fat and breast cancer and Dr. Greenwald and his colleagues on dietary fiber and colon cancer. In the nurses' breast cancer study of Professor Willett's group, it may be noted that a slight reduction of dietary fat from a very high level to a high level does not permit analysis of the kind of diet primarily comprised of a variety of plant produce where fat intake would not only be much lower--perhaps 15-20% of calories--but also where favorable changes in other nutrient intakes would simultaneously occur. This total diet effect is what the 1982 National Academy of Sciences report on "Diet, Nutrition and Cancer" really had in mind when they recommended an increased consumption of fruits, vegetables and whole-grained cereal products. This panel also offered the opinion that a fat intake even lower than the practical target of 30% of calories might be even more beneficial for cancer risk reduction. In my view the results of Professor Willett's study illustrate very nicely that a minor cosmetic change in dietary fat intake (with uncertain small changes in other nutrients) cannot be expected to do much for cancer risk, once again telling us that focus on a single nutrient is inappropriate for setting nutrition and health policy.

On the claims that dietary fiber may reduce the risk of colon cancer, I would urge that we heed Dr. Greenwald's suggestion that this information be kept in context. That is, there is no evidence to indicate that the addition of a bit of fiber of unknown composition to a specific food commodity will achieve any particular benefit. Dietary fiber is not only exceedingly complex but is also only a small bit of a very complex mixture. At present, we have no way to know which fiber fraction, if any, would affect colon cancer risk. Unfortunately, the recent marketplace focus on fiber actively encourages in the advertisements an increased consumption of low-fat skim milk products and lean cuts of meat which tend to go in exactly the opposite direction from the recommendation to increase the consumption of a diet with varied plant produce. In other words, the focus on fiber or fat in these health claims once again results in gimmickry out of context, resulting in the encouragement to consume food and nutrients inappropriate for reduction of risk of chronic degenerative diseases.

In my view, the widespread confusion about nutritional guidelines and chronic disease risk is directly attributable to the use of scientific data which are much too narrowly focused for policy and marketplace purposes. This is a very serious problem which permeates our entire society. Unfortunately too many consumers believe in magic bullets, too many corporations believe in profit-rich products with very specific health claims, too many research scientists probe atomistic mechanisms as the answer to policy, and too many policy people demand precise standardization of intake and response as a means of decision making. Along the way, promotion of long term health as a means of disease prevention is lost sight of. I believe this to be a very serious problem that, if left unchecked, will lead to even more confusion and controversy in the future.

Detailed scientific information on diet, nutrition and disease is now being produced at a rate so great that almost anyone can find evidence to support their favorite hypothesis. When we limit our vision in this field only to the detailed data, contradictions abound throughout the literature.

To avert this crisis, I would suggest the following.

1. A scientific body needs to be established for the purpose of regularly reviewing and reporting on dietary and nutritional data of importance to the etiology of chronic degenerative diseases such as cardiovascular disease, cancer, diabetes, osteoporosis and other 'diseases of affluence' which account for the vast majority of premature deaths in this country. Existing institutions such as the National Academy of Sciences could readily meet this need. I envision a 5-year review of information rather similar to that used for recommended daily allowances of nutrients but directed, instead, to the effects of total diet on these diseases. As a society, we desperately need a public institution with a high professional standard and good public trust to undertake the task of vigorously reviewing and interpreting data of this kind. If such a review procedure is not adopted, then our society is left to the

whims of the private sector whose vested interests and public pronouncements on very specific products already seriously compromise public understanding of these issues.

2. In addition to the existing research programs of the National Institutes of Health, I would suggest that more consideration be given to studies on humans that will permit comprehensive analysis of diet, nutrition and disease relationships. I have in mind two kinds of large scale projects. Such projects, in my view, are the only way to study these important relationships in the context of all diseases, all dietary habits and all environmental lifestyles. Comprehensive evaluation of this kind is absolutely essential if the fragmentation of contemporary information is to be reduced.

I would recommend two kinds of human-based studies. The first would examine, prospectively, a very large nationally-selected cohort of people who represent diverse but reasonably stable dietary practices. At the outset of the study (and perhaps a second time), individuals would provide biological specimens and other information for storage, later to be retrieved and comprehensively analyzed upon disease onset or death. (This type of design assumes that satisfactory arrangements can be made to track these individuals to properly register cause of death.) Biological specimens would be analyzed for as large a number of possible disease onset indicators as contemporary methodologies would allow. In this way patterns of metabolic indicators of health and disease onset which better reflect the panorama of exposure, could then be studied. I cannot understand how information of this sort can be obtained in any other way.

The second type of study is directly addressed to the need to know the health consequences when people intervene with a new dietary lifestyle. It would be similar in design to the dietary fat-breast cancer intervention project of NCI recently suspended. The dietary habits of most Americans are substantially different from the contemporary recommendations to consume a plant-enriched diet. We need to remove the doubt that surrounds these recommendations. However, instead of putting the focus only on dietary fat and only on breast cancer as was recently proposed, the study that I envision should include a complete evaluation of the whole diet, not just tiny bits of it, and all disease events, not just breast cancer. A full profile of metabolic and dietary events should be monitored so that responders and non-responders (to the onset of disease) can be examined in some detail. For those in the treatment group who will unexpectedly (according to the hypothesis) incur the disease, we need to know why, and a comprehensive analysis of their metabolic indicators is the only way to get such information. Some have suggested that the experimental subjects of such a study will not sustain the low-fat type of diet. This criticism appears to come from those who either do not want such a study undertaken for other reasons and/or who do not really understand nutritional biology. People do change their eating habits. We fail to recognize that several months, perhaps even a year or two is required for adaptation to new tastes; moreover, new metabolic states and new nutritional requirements usually follow and then, after adaptation, the old dietary habits are no longer desirable. In this proposed study it would also be necessary to provide imaginative culinary advice; new dietary lifestyles can readily be developed from attractive menus and it would be helpful to give such subjects a few of the newer ideas on menu planning that are now beginning to appear. And finally I would recommend that more nutritionists be involved in the planning of such a study; it was distressing to hear the ill-informed comments on nutrition made by the last group of advisors and planners.

These are the only two recommendations for research that I offer. I am prompted to recommend these studies instead of the "comprehensive plan for the assessment of the nutritional and dietary status of the United States population and the nutritional quality of the United States Food supply" proposed in S. 1081--at least when such a survey is envisioned as a means to discover causes or trends in the development of food-related diseases. The vast majority of Americans are already sustained on a dietary practice that leaves little room for selecting the experimental comparison groups for the comprehensive study of chronic disease etiology. For example, it is my belief that diets with more than, say, 25-30% of fat as calories and less than 20-25 grams of dietary fiber per day (i.e., most American diets) are already in a risk category for which little meaningful distinction on disease risk can be made. If a nationwide survey were to be useful for evaluation of diet-disease relationships, then there needs to be enough individuals on plant-rich diets with mean fat intakes of 15-20% of calories and fiber intakes of at least 30-40 gm/day. Because there are precious few such individuals in the U.S., a nationwide nutrition survey essentially accomplishes nothing because it studies only one group. Instead, appropriate prospective and intervention studies are required for studies on diet-dependent diseases.

Aside from my background in basic research on nutrition and cancer during the past 25 years, I also obtain these views from our experiences in The Peoples Republic of China where we have, with our Chinese and British colleagues, embarked on a series of very large surveys of diet and disease relationships. The first survey conducted in 1983 studied, in detail, dietary and lifestyle practices in 130 mostly rural Chinese villages located in 65 counties across the country. This project attempts to determine the important associations of dietary, biochemical and lifestyle characteristics with the highly localized patterns of diseases known to occur in China. Although of little use for analytical purposes, age-standardized total cancer mortality rates is 23 times higher in the highest survey county than in the lowest; specific cancer mortality rates vary even more than this. This and future studies now ongoing or being planned, emphasize the totality of dietary, nutritional and lifestyle factors upon the etiology of all diseases so that observations made between variables are placed in context. This is a feature which is missing in virtually all of our Western studies.

A few examples from this Chinese study might illustrate the value of studying diet-disease relationships in context. In China plasma cholesterol levels for individuals aged 35-64 years range from about 90-175 mg/dL; Chinese highs are near U.S. lows. Thus, with these data, we can determine whether a downward trend in plasma cholesterol levels below about 180 mg/dL is also associated with a downward trend in cardiovascular disease rates or whether there might be an increase in other diseases such as colon cancer, as was suggested by a few case control studies in the U.S. Indeed, based on a dose-response relationship plotted by Richard Peto, our chief epidemiologist and British Principal Investigator from the University of Oxford, cardiovascular disease continues to decrease with lower levels of plasma cholesterol, as expected. Moreover, colon cancer also decreases with plasma cholesterol, an association which is highly significant ($r=+0.44$, $p < 0.01$). Such an observation provides further evidence that the U.S. data showing an increase in colon cancer at the lower cholesterol levels is an experimental aberration resulting from plasma cholesterol levels being depressed by incipient disease occurring at the time of sampling and assay.

Total energy intake standardized for body weight is about 20% higher in China than the U.S., yet there is very little obesity amongst Chinese. This finding tells us that excess caloric intake does not necessarily cause excess body weight nor is it likely to be the determinant of chronic disease risk. Similar observations of a lack of an association between caloric intake and obesity have been in the nutrition literature for at least 100 years; it is only of late that some non-nutritionists are beginning to discover it. Thus, the Chinese data give a very important new insight into the dietary experiences of Americans and, I might add, into our own misunderstood history of nutrition research.

With the exception of one of our 65 survey counties, fat intake in China ranges from a low of 6% of calories to a high of 25%, with an average around 15%. We don't yet see evidence suggesting compromise of health with such low fat intakes although this observation still requires more detailed evaluation. Who said that people cannot subsist on diets with fat intakes being much lower than 30% of calories and actually like such diets?

Mean dietary fiber intake in China is 34 g/day, ranging from 8-77 g/day. Average intake in the U.S. is only around 10 g/day. The recommendation by the National Cancer Institute to increase intake to 30 g/day in the U.S. would appear to be a modest one.

Concerns have been expressed in some quarters in the U.S. that a high fiber intake could compromise mineral status. However, this concern is not borne out by the Chinese data. The levels of plasma iron, zinc and magnesium, for example, are not compromised by high fiber intake. In fact, all measurements on iron status indicate excellent health with respect to this nutrient amongst the adult Chinese in this study. Hemoglobin values in China actually are positively correlated ($r=+0.24$, $p <0.05$) with fiber intake.

These observations are but a meager amount of that which will eventually become possible from this and future studies in China. By way of a word of caution, I am very much aware that with such a data base it will be possible to select various interesting associations to support a particular point of view, including my own. For this, and other reasons, the Chinese have very kindly offered to allow these data to be made available in their original data form so that all investigators can review and interpret the data from their various vantage points. (Incidentally, it should be noted in passing the substantial funding contributions contributed by the Chinese to this series of studies.)

In conclusion, I can hardly emphasize enough the importance of nutritional and dietary practice as a cause of American diseases of affluence. These diseases account for more than three-quarters of premature U.S. mortality and the evidence of a nutritional link, however fragmented it appears to be, is nonetheless highly impressive when examined comprehensively. In my view, we are sitting on a gold mine opportunity. Dietary and nutritional advice, along with assertive recommendations against smoking, which according to some estimates will kill over 200 million of the people now living in the world, mean savings of health care costs and a lot of misery along the way. But our society desperately needs the assistance of your good offices in the further development of research and public information programs. Otherwise, we are at the mercy of collecting bits of fragmented information too often paid for and dispensed by those who have vested interests to protect.

DIET AND HEART DISEASE

Testimony before the United States Senate Committee on Governmental Affairs

relative to the

"National Nutrition Monitoring and Related Research Act of 1987"

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Chairman Glenn; distinguished Senators; ladies and gentlemen: I am Dr. John C. LaRosa, Dean for Clinical Affairs and Director for the Lipid Research Clinic at The George Washington University Medical Center. I am also currently serving as Chairman of the Nutrition Committee of the American Heart Association. It is a privilege to address you today on our current understanding of the relationship between diet and heart disease. I have submitted as part of my written testimony the most recent position statement of the American Heart Association on dietary guidelines for healthy American adults.[1] That statement and the references which it contains comprise a representative and succinct summary of our current knowledge of the relationships between diet and heart disease, and in particular, that form of blood vessel disease which we call atherosclerosis. It is this disease, characterized by the gradual accumulation of cholesterol, cellular debris and scar tissue on the walls of arteries which supply the heart itself, which is responsible for the largest portion of heart and blood vessel disease facing our society. In this brief statement I would like to present to you my own view of the nutritional issues currently thought to be related to atherosclerosis. I wish to emphasize that these are my own views. Unlike the dietary guidelines, they do not necessarily represent the official policy of the American Heart Association.

I think it is useful to divide nutritional issues related to atherosclerosis into three categories: 1)those which are decided beyond reasonable doubt (table 1), 2) those in which there is still some controversy among responsible scientists and health professionals (table 2), and 3) those in which insufficient evidence exists or about which there has been substantial misrepresentation in the media and popular press.

Let me begin with those issues about which I think there is relatively little controversy left. There is, I believe, overwhelming evidence from animal experiments, population studies and human clinical trials that high intakes of saturated fats and cholesterol in the diet are direct causes of atherosclerosis. There is, moreover, now a widespread consensus that low saturated fat and low cholesterol diets, which lead to lower cholesterol levels in the blood, can, in many individuals, substantially reduce the occurrence of atherosclerosis. It is important to point out, however, that saturated fat and cholesterol are chemically distinct. While saturated fat is an important nutritional determinant of blood cholesterol levels, dietary cholesterol, itself, is less important. Thus, some foods which may contain high levels of saturated fat are potent factors in raising cholesterol levels even though they contain no cholesterol. This is true, for example, of coconut and palm oil, which are vegetable oils used in the preparation of many packaged foods. On the other hand, there are some foods, like eggs, which contain large amounts of cholesterol, but only small amounts of saturated fat. Thus, on the one hand, a foodstuff which is claimed to have "no cholesterol" may nevertheless raise blood cholesterol levels, while a diet which seeks to lower blood cholesterol only by eliminating eggs is likely to be unsuccessful if it does not also address saturated fat intake.

Polyunsaturated fats, such as those found in common vegetable oil (for example, corn oil and safflower oil) lower circulating cholesterol levels. Because there are few populations which naturally consume large amounts of such polyunsaturated fats, however, earlier enthusiasm for diets very high in polyunsaturated fat has been tempered and the Heart Association currently recommends that such polyunsaturated fat contribute no more than about 10% of the total calories taken in daily.

There is also widespread agreement that caloric intake is very important in the genesis of heart disease. It has been said with some justification that western societies suffer more from diseases of over rather than undernutrition. Most of us could profitably lower our caloric intake, a process aided by reduction of fat intake, since all fats, whether saturated or polyunsaturated are "calorie dense," that is, they contain nine calories/gram compared to carbohydrate and protein which contain only four calories/gram. Thus, those who attempt to lose weight by avoiding potatoes, bread and pasta but substitute unlimited quantities of fatty meats are fighting a losing battle.

Americans ingest more salt than they need. In studies comparing different populations, those with high salt intake are more likely to have high blood pressure and its many consequences than populations which have lower salt intake. It is unclear to me, however, whether all individuals must limit salt intake since many of us are able to take in (and promptly excrete) large quantities without risk. The disparity between what we need, which is about 0.2 grams/day, and what we take in, which is 20 to 30 times that amount (4 - 6 grams/day), is large. It seems prudent, therefore, to limit salt intake to no more than 2 grams/day, unless high blood pressure is present or there is some other reason to be more strict.

Finally, in the category of issues about which there is consensus, I would put alcohol consumption. It is surprising (one might even say sobering) to realize that alcohol contributes 5% of all calories consumed by Americans, and 10% of those who drink any alcoholic beverages. While there are probably no ill effects in modest alcohol consumption (that is 1 or 2 ounces of ethanol a day, approximately one drink per day), there is increasing evidence that higher levels of alcohol consumption are linked to high blood pressure. Of course, when taken in excessive amounts, alcohol leads to disrupted social functions and severe organic illness of the heart, liver and brain.

While there is some evidence that modest alcohol consumption may favorablv affect the distribution of cholesterol in the blood, that is not sufficient reason to recommend alcohol intake in the hope of preventing atherosclerosis.

The second category of nutritional issues related to heart disease are those which still must be judged controversial (table 1).

First, there are the polyunsaturated fats which come not from vegetables but from fish, the so-called omega-three fatty acids. In a manner somewhat similar to aspirin, these fats interfere with blood clot formation. In large quantities they lower blood levels of a fat called triglyceride, chemically and metabolically distinct from cholesterol. In population studies, ingestion of fish is correlated with lower rates of atherosclerosis, particularly of the blood vessels supplying the heart. It is not clear from those studies whether it is the oil in fish or some other element, (perhaps including simply the substitution of fish for other foodstuffs which contain saturated fat) which is responsible for the lower rates of heart disease. In animal studies, there is more direct evidence that fish oils do, in fact, prevent atherosclerosis, but it is unclear whether that effect is mediated through its effect on blood clotting or its effect on blood fats. Thus, the role of fish and fish oils remains an interesting scientific question but one which is not yet ready for public health recommendations.

In similar fashion, there is currently enthusiasm for increased ingestion of olive oil, which contains large amounts of a type of fat which is called monounsaturated. There is particular interest in this form of fat because it appears to favorably influence the distribution of cholesterol in the blood, lowering the fraction of cholesterol which is thought to deposit in blood vessels walls (the so-called "low-density lipoprotein" or LDL cholesterol) while leaving unaffected that fraction of cholesterol which is responsible for the removal of excess cholesterol from the body ("high-density lipoprotein" or HDL cholesterol).

There is some evidence that populations in the Mediterranean basin, which consume large amounts of monounsaturated fat in the form of olive oil, have lower rates of heart disease despite rates of total fat consumption in the diet (30 - 35%) which approach those in the United States. As is the case with fish oils, however, the totality of data relating monounsaturated fat to heart disease is not yet of sufficient magnitude to warrant public health recommendations.

The issue of fiber content of the diet has received considerable attention in the last several years. Insoluble fiber, such as is found in wheat bran, has little effect on blood cholesterol levels or coronary heart disease rates. Soluble fiber, such as that found in oat bran, does appear to have a modest capacity to lower blood cholesterol levels. There is currently considerable research activity addressing the effects of soluble fiber either in the form of oat bran, psyllium (such as is found in commercial bulk laxatives) and quar and pectins found in fruits and vegetables. To date, these results demonstrate real but modest declines in cholesterol levels and must be regarded as preliminary. There appear, however, to be good reasons for increasing the fiber content of the diet aside from its cholesterol lowering effect, including the promotion of weight reduction and the prevention of certain forms of gastrointestinal cancer.

Finally, increasing evidence indicates that not only sodium but also other minerals, such as potassium, calcium and magnesium, may be important in the control of blood pressure and that higher consumption of these minerals results in lower blood pressure. Again, these findings should be regarded as preliminary and not yet ready for general recommendation.

Also in the realm of controversy are several issues not related to particular foodstuffs, but rather to public policy. As I noted earlier, there is a broad consensus that lowering dietary saturated fat and cholesterol is of benefit in preventing heart disease. There still remains some controversy about whether dietary change is required for all Americans or only those whose blood cholesterols are elevated. The American Heart Association, of course, has taken the position for the last 20 years that all Americans should institute such changes in their diets. A recent statement by the National Cholesterol Education Program, sponsored by the National Heart, Lung and Blood Institute, pointed out that cholesterol levels over 240 mg/dl, which are present in about 25% of the adult population, should definitely be regarded as increasing the risk of heart disease, while those above 200 mg/dl, present in 50% of U.S. adults, are at greater than average risk. It is difficult to conceive of a practical approach to such a widespread problem that does not include broad public health recommendations. Nevertheless, there are some well-informed and thoughtful members of the scientific community who remain skeptical about the necessity for such a broad approach.

In somewhat similar fashion, there has been some public debate about the advisability of recommending dietary change in children whose dietary needs are unique as they undergo development. These issues were recently addressed at a joint meeting of the nutrition committee of the American Heart Association and the American Academy of Pediatrics.[2] In general, this statement recommended no dietary changes for children under two years of age, encouraged reduction of total fat intake to 30% of calories with saturated fat reduced to 10% of calories, discouraged excessive dietary restrictions which might limit mineral intake and acknowledged that many children were already eating diets recommended by the American Heart Association with no ill effects.

There is also concern among some that we have insufficient data to make strong dietary recommendations for older individuals and that the potential exists of depriving such individuals of inexpensive sources of high-quality protein such as is found in dairy products and eggs. It is certainly true that we are only now beginning to develop the data base which will allow us to decide whether blood cholesterol levels continue to be important predictors of morbidity and mortality in older individuals. On the other hand, a strong case can be made that in both dairy products and eggs, which indeed contain high-quality protein, the fat can be partially or totally eliminated, leaving the caloric content and preserving the nutritional value of food.

In the third category are those dietary issues which lack substantial evidence of benefit in the prevention of heart disease or which have been misrepresented in popular writings in the media (table 3).

The first of these is lecithin consumption, a popular pastime but one which has never been demonstrated either to significantly reduce blood cholesterol levels in humans or to effect rates of heart disease.

A recent popular book extolls the virtues of gram quantities of the vitamin niacin.[3] In such doses, niacin does, in fact, result in lower blood cholesterol levels. It should be remembered, however, that quantities of niacin in this range do not function as a vitamin but rather as a drug, with potentially serious side effects. Self-medication with niacin should be avoided. Niacin in gram quantities (also known as nicotinic acid) should be given only under the supervision of a physician since it may cause high blood sugar, high blood uric acid, abnormal liver functions, and, more rarely, skin disorders in susceptible individuals.

There has been, from time to time, much enthusiasm about Vitamin C or vitamin E, either because of their direct effect on blood cholesterol levels or their effect on atherosclerosis itself. Much of the scientific work in this area has been in animals and of dubious application in human beings or has been of such poor quality as to be uninterpretable. It is important, however, to point out that there is now some preliminary evidence that substances which are anti-oxidants (both vitamin C and vitamin E fall into that category) may render low-density lipoprotein cholesterol inaccessible to the walls of blood vessels and therefore may help to prevent atherosclerosis.[4] These are very interesting and very preliminary results. There is no reason on the basis of such data, however, (which has actually been gathered not with vitamin C or vitamin E but with a drug called probucol) to make public health recommendations at this time. Anti-oxidants, however, remain an interesting avenue for research. I only hope that we will not shortly see a popular - and premature - book written about the atherosclerosis-preventing diet containing vitamin C or Vitamin E.

There are currently under development fat substitutes which are lower in caloric content than natural fats, may be used instead of fat in food preparation and may even help to lower blood cholesterol and body weight. I urge you to regard these substances with interest and skepticism. There are no panaceas for our nutritional overindulgences. The safety of substances which will be widely distributed in the food chain should be proven, not assumed.

Finally, there are from time to time various claims for trace elements in the diet and their alleged virtue in preventing blood vessel and heart disease. Such claims should be greeted with the same skepticism that all dietary claims are made, and it should be remembered that statistical associations do not make causal relationships. I always tell my students that because red hair and freckles are highly correlated is no reason to expect that one causes the other or that the elimination of one will necessarily change or eliminate the other.

That leads me to my final point. I have listed in my presentation several items which are of scientific interest but not yet ready for public health application. The point at which an issue crosses that line is not clearly defined, and that issue is one which has concerned those of us in the Heart Association and in many other organizations which make recommendations to the public for some time.

I wish to offer you some overall guidelines which are not at all original but which are helpful in making such decisions. These can be found in any elementary textbook of epidemiology, and are based on recommendations made by Dr. Bradford Hill more than 20 years ago.[5] In considering the possible cause and effect between a dietary factor and a disease, the following should be noted:

1) How strong is the association? That is, is there a much larger chance of getting the disease among those who partake of a particular diet compared to those who do not?

2) How consistent is the association? Does it hold from one population to another? Is it as true in Eskimos as in Scandinavians?

3) Is the association temporally plausible? It would be, for example, difficult to conclude that a causal relationship existed between lung cancer and cigarette smoking if all cases of lung cancer preceded the adoption of cigarette smoking as a habit.

4) How specific is the association? That is, is the particular dietary factor associated with a wide variety of diseases or a more limited number? This is perhaps not as critical as others but is simply one more element in the decision as to whether or not cause and effect exists.

5) Is the association biologically plausible? That is, is it consistent with what we know about the causes and development of the disease in question? Clearly, one must say that some rather implausible associations have led us to new thinking about a particular disease. This criterion, like all of the others, cannot be accepted without the usual degree of scientific skepticism.

Nevertheless, taken as a body, these five points make it somewhat easier to judge whether there is cause and effect between a particular habit, whether dietary or other, and the development of a particular disease, and allow us to make some decisions about when we have accumulated sufficient evidence to make public health recommendations.

In closing I would like to make one other point. If we come to the point at which we feel that recommendations are necessary, it is important to make quantitative recommendations. There is very little value to guidelines which do not set specific numerical targets. It must, of course, be remembered that such recommendations are only guidelines and targets and that not each and every individual can or will achieve them. Without such targets, however, recommendations become only pleasant homilies without much effect. In fact, they can serve as the basis for a false sense that we have dealt with an issue when we have not.

We should not shy away from making such quantitative recommendations even though we may be in the position at some future time of having to change them. As Dr. Bradford Hill pointed out more than twenty years ago, "All scientific work is incomplete, whether it may be observational or experimental. All scientific work is liable to be upset or modified by advancing knowledge. That does not confer upon us the freedom to ignore the knowledge we already have, or to postpone the action that it appears to demand at a given time."[5]

Thank you very much.

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TABLE 1

Broad Consensus

* dietary saturated fat and cholesterol raise blood cholesterol (LDL-cholesterol)

* dietary unsaturated fats (vegetable oils) lower blood cholesterol

* other diet components to be considered:

calories
salt (sodium)
alcohol

TABLE 2

Controversial Issues

* effect of fish oils
* effect of monounsaturated fats
* effect of fiber

on blood fats
and heart disease

* effect of other minerals (calcium, potasium, magnesium) on blood pressure

Policy Issues:

* dietary changes for entire population
* dietary changes in children
* dietary changes in elderly

TABLE 3

Insufficient Evidence or Public Misrepresentation

- lecithin
- niacin (as a "diet" supplement)
- anti-oxidants
- "artificial" fats
- trace elements

TABLE 4

Guidelines for Making Dietary Recommendations

1) strength of association

2) consistency of association

3) temporal plausibility

4) specificity

5) biologic plausibility

Position Statement

Dietary Guidelines for Healthy American Adults

A Statement for Physicians and Health Professionals by the Nutrition Committee, American Heart Association

This statement for physicians replaces the American Heart Association's Dietary Guidelines for Healthy American Adults, published in 1986. The current guidelines propose an optimal preventive diet for coronary heart disease. Emphasis is placed on reduction of both saturated fat and total fat. Complex carbohydrates are recommended as the major replacement for calories from fat. Polyunsaturated and monounsaturated fats partially replace calories from other fat sources. Cholesterol and sodium guidelines are expressed with an upper limit on each. The use of alcohol as a possible means of preventing cardiovascular disease is not advised. Maintenance of recommended body weight by calorie control and physical activity is emphasized.

Prevention of cardiovascular diseases remains the foremost goal of the American Heart Association (AHA). At present, heart attack and stroke due to arteriosclerotic vascular disease are the major causes of death and illness in Western society. For more than 25 years, the AHA has recognized the large body of scientific evidence linking dietary factors to the etiology of arteriosclerosis. During this period, additional epidemiologic studies, animal experiments, and clinical research have strengthened the evidence.[1,2]

The content of the habitual diet can be closely related to several major risk factors for heart attack and stroke. Elevated blood cholesterol, obesity, and high blood pressure have strong dietary determinants. Since reductions in blood cholesterol and blood pressure have been shown to decrease the incidence of cardiovascular disease in previously healthy adults, added emphasis is placed on dietary modifications that may minimize these risk factors.[3-8] This approach is particularly important in individuals with blood cholesterol levels above 200 mg/dl. Cholesterol levels above 240 mg /dl should be further evaluated by lipoprotein fractionation. The AHA has published guidelines for the diagnosis and treatment of hyperlipidemia[9] that have been modified to be consistent with those recently published by the Adult Treatment Panel, National Cholesterol Education Program.[10]

In an effort to prevent heart and vascular diseases, the following dietary guidelines are offered to all healthy American adults as safe and prudent. Since the recommendations are given in quantitative terms, they should be translated into eating patterns by the public with the guidance of a physician and/or nutritionist.

Dietary Guidelines

1. Total fat intake should be less than 30% of calories.
2. Saturated fat intake should be less than 10% of calories.
3. Polyunsaturated fat intake should not exceed 10% of calories.
4. Cholesterol intake should not exceed 300 mg/day.
5. Carbohydrate intake should constitute 50% or more of calories, with emphasis on complex carbohydrates.
6. Protein intake should provide the remainder of the calories.
7. Sodium intake should not exceed 3 g/day.
8. Alcoholic consumption should not exceed 1–2 oz of ethanol per day. Two ounces of 100 proof whisky, 8 oz of wine, or 24 oz of beer each contain 1 oz of ethanol.
9. Total calories should be sufficient to maintain the individual's recommended body weight.*
10. A wide variety of foods should be consumed.

Rationale for Dietary Guidelines

1. Total fat intake in the United States is currently 37% of calories. Fat is a dense source of energy, providing 9 cal/g. Only a few grams of polyunsaturated fats each day provide an adequate supply of essential fatty acids. Since low-fat foods provide more bulk per calorie, they are a logical choice in an eating pattern designed to achieve and maintain the individual's best body weight. The recommended reduction in total fats should be achieved largely by reducing the intake of saturated fat.

2. Saturated fat intake has been correlated with serum cholesterol values and coronary heart disease in many epidemiologic studies.[11-13] Increasing saturated fat consumption in humans increases low-density lipoprotein (LDL) and total serum cholesterol values. In laboratory animals, the rise in serum cholesterol is followed by development of arteriosclerotic lesions that regress when saturated fat is removed from the diet.[14]

Currently, Americans consume an average 15% of

Approved by the Steering Committee of the American Heart Association.

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* Metropolitan Tables of Height and Weight. Table of Desirable Weights for Men and Women. Metropolitan Life Insurance Company, New York, 1959.

calories as saturated fats.[15,16] Much of this is animal fat in which palmitic (C_{16}) and stearic (C_{18}) acids are the major constituents. Coconut oil, palm oil, and palm kernel oil also contain large amounts of lauric (C_{12}) and myristic (C_{14}) acids, both of which raise serum cholesterol.[12] The diets of many healthy, well-nourished populations derive less than 7% of total calories from these fats.[3]

To meet the recommendation of consuming less than 10% of calories as saturated fat requires reducing the intake of these fats by about one-third.

3. Monounsaturated and polyunsaturated fats are equally rich in calories but have no known undesirable effects on serum cholesterol. Monounsaturated fats currently contribute 15% of calories to the average American diet, while polyunsaturated fats contribute 7–8% of total calories.

Monounsaturated fats may be obtained from vegetable sources. The habitual diet of some populations in the Mediterranean region contains 30–35% of calories as fat, with more than half of these from monounsaturated fats. These groups have a low incidence of heart disease. It should be noted, however, that intake of saturated fat is 7% or less of total calories in such populations,[17] compared to current intake in the United States.

Polyunsaturated fats are derived from vegetable oils containing linoleic acid (C_{18}) and from fish and other seafood containing eicosopentaenoic (C_{20}) and docosohexaenoic acids (C_{22}). These foods in small quantities can supply essential fatty acids. The average dietary intake of polyunsaturated fats has increased from less than 2% of calories to 7–8% of calories over the last 40 years. In some clinical studies, polyunsaturated fats have provided 15% or more of calories for 5 years or more without apparent ill effect. True vegetarians eat similar amounts of polyunsaturated fats. However, because of the relatively small amount of data on the long-term use of diets with very high polyunsaturated fat content, it is recommended that these fats contribute no more than 10% of calories.[18,19]

Eicosopentaenoic and docosohexaenoic fatty acids (ω-3) are the long-chain polyunsaturated acids attracting much recent interest. The most common dietary sources are fish oils. Current studies suggest that they may reduce platelet aggregation, thereby offering potential desirable effects in prevention of blood clotting and atherosclerosis. Some studies show that when large quantities of these fatty acids are consumed, blood triglyceride levels may be reduced. There is little evidence that ω-3 fatty acids are useful for substantially reducing LDL cholesterol levels. Until further research is conducted, specific quantitative recommendations for ω-3 fatty acids cannot be made.[20] The use of fish oil supplements to lower blood cholesterol levels is not recommended.

4. Dietary cholesterol intake has been related to blood cholesterol level in many studies.[21,22] Cholesterol intake has its greatest effect in the presence of high saturated fat intake. The effect of cholesterol intake on blood cholesterol level is particularly evident between 0 and 300 mg cholesterol per day. A smaller change in blood cholesterol occurs at larger amounts of intake.[21-24]

All cells in the body can make cholesterol, and there is no biochemical or physiological evidence that cholesterol is required in the diet. Some vegetarians consume less than 10 mg/day without ill effect.

5. Protein in the diet provides the essential amino acids for synthesis of enzymes and structural proteins. Less than 70 g/day of carefully selected protein can supply sufficient amino acids in a man of average size.

Little additional protein is needed for muscle repair, even among those participating in heavy physical work or athletic training. In such individuals, protein intake beyond 2 g/kg of body weight is not warranted. Consumption of large quantities of meat does not aid in building muscle. Excessive meat consumption frequently results in an undesirable increase in the amount of saturated fat in the diet.

It is easy to provide adequate protein from a proper mixture of vegetable sources alone. However, consumption of less than the recommended dietary allowance of vitamin B_{12} may result when no meat is consumed.

This recommendation for protein does not significantly differ from current protein intake.

6. Carbohydrates, particularly complex carbohydrates such as vegetables and grains, constitute 60–75% of the calories of populations who have a low prevalence of arteriosclerosis but are well-nourished and healthy by American standards. In this country, approximately 40–45% of calories are derived from carbohydrates; one-third to one-half are from simple sugars.

The AHA recommends that carbohydrate intake be increased to at least 50–55% of total calories, with emphasis on greater use of vegetables, fruits, and grains.

Foods high in complex carbohydrates are usually low in caloric density and contain a wide variety of vitamins and minerals. In addition, food sources of complex carbohydrates often contain soluble and insoluble fiber. Evidence that certain soluble fibers, such as pectin, guar, and oat bran help lower serum cholesterol is limited.[25,26] No specific recommendations about fiber can be made at this time.

7. Sodium intake, on the average, far exceeds the physiological needs of healthy Americans. The healthy body can function quite normally and indefinitely with a sodium intake of less than 0.2 g/day, whereas present consumption has been estimated at 4–6 g/day.

Cross-cultural studies show a clear relationship between the incidence of high blood pressure and sodium content of the habitual diet.[27-29] In persons with high blood pressure, there is frequently a significant reduction in blood pressure when sodium intake is restricted to less than 0.5 g/day.[30]

In fact, many persons with mild to moderate elevations in blood pressure may benefit even from modest restriction, such as 2 g/day or less of sodium. However, studies have been of short duration and have not considered a possible preventive effect on hypertension of moderating sodium intake.[31,32] In individuals requiring medication, reduced sodium intake may be of value as an adjunct to hypertensive drugs.

The AHA believes that epidemiologic evidence supports the recommendation that sodium intake not exceed 3 g as safe, feasible, and probably useful in prevention of high blood pressure in many Americans.

In the American diet, approximately one-third of sodium is derived from naturally occurring food sources, one-third from sodium added to food during processing, and one-third from additions by the individual.

Other minerals such as potassium,[33] calcium,[34,35] and magnesium[36] may also be important in control of high blood pressure. In some studies, higher intakes of these minerals than usually consumed by many Americans correlates with lower blood pressure. Although these observations may be important, current scientific information relating potassium, calcium, and magnesium intake to cardiovascular disease incidence is inadequate to make specific dietary recommendations.

8. Alcohol consumption among Americans has increased markedly over the past three decades. Surveys indicate that alcohol contributes 5% of all calories consumed by Americans and approximately 10% of calories when only those who drink alcoholic beverages are considered. When intake is less than 1–2 oz of ethanol/day, no significant ill effects of alcohol consumption on health have been observed in healthy adults. When excess alcohol is consumed, the ill effects are well established. Disrupted social function, increased accidental death, increased liver disease, and certain types of cancer and heart failure are frequently observed and easily documented. Excess calories associated with alcohol consumption may contribute to obesity.

There is increasing evidence of a link between high blood pressure and alcohol consumption in susceptible individuals. For those who consume more than 2 oz of ethanol/day,[37] there is a significantly higher incidence of high blood pressure.

Modest alcohol consumption has been associated with beneficial effects. High-density lipoprotein levels tend to be higher, and in some studies, the incidence of coronary heart disease is lower than in those who abstain. However, no studies have demonstrated that increased alcohol intake will significantly reduce vascular disease in human or animal models.

In view of the many negative aspects of alcohol consumption, the AHA does not advise its use in the hope of preventing cardiovascular disease.

9. Total calories consumed are frequently greater than the energy needed for the body's metabolic activity and muscular work. Americans are becoming more obese. Excess body fat is clearly related to an increase in the prevalence of high blood pressure, elevated serum cholesterol, and diabetes mellitus. Newer evidence suggests that even a moderate increase in adipose tissue, producing an excess body weight of 10–30% in young adults and middle-aged persons, is linked to heart disease. This relationship is present even after allowing for its effects on other risk factors.[38,39] The AHA recommends that physical activity be increased and where appropriate, total calories reduced to bring body weights into the ranges defined by the 1959 Metropolitan Life Insurance Company tables, or by ratios of waist-to-hip circumference of less than 0.8 for women and less than 1.0 for men.

10. The guidelines outlined here should be translated into a nutritionally adequate diet incorporating personal preferences, as well as social, cultural, and economic considerations. Selection of a wide variety of foods, tastefully prepared, promotes adherence to a low-fat, low-cholesterol, low-sodium regimen.

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THE ROLE OF DIETARY FACTORS IN THE MAINTENANCE OF NORMAL GROWTH AND DEVELOPMENT DURING THE FORMATIVE YEARS AND THEIR ROLE AS ANTECEDENTS OF CHRONIC DISEASE PROCESSES IN ADULTS

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Perhaps nothing is more important to any society than the health and well being of its children. During the past several decades evidence has been steadily mounting that the diet consumed by the pregnant woman and the young child may be very important in determining not only immediate health and well being but also health status and susceptibility to disease in adult life. This report will review some of the evidence relating diet to the outcome of pregnancy and the growth and development of infants and children. In addition, it will discuss the relation of early dietary practices to certain serious chronic diseases in the adult years.

Diet and the Outcome of Pregnancy

Although the infant mortality in the United States has steadily declined throughout this century from 100 deaths per thousand live births in 1900 to about 10.4 deaths per thousand live births in 1986, there are 15 industrialized countries that have a lower infant mortality rate than the United States. For example, the infant mortality rate in Finland and Japan in 1983 was about 6.5 per thousand. This relatively high infant mortality rate in the United States is related to the heterogeneity of our population. Thus in 1984 the infant mortality rate among blacks was 18.4 per

1,000 live births (a figure approaching the rate of many developing countries). Perhaps even more important from the standpoint of this bill are the changes that have occurred in infant mortality in the United States in recent years. Among whites from 1974 to 1984 infant mortality dropped from 12.0 to 9.4 and among American Indians from 13.7 to 9.5, whereas during the same period among blacks infant mortality was 23.1 in 1978 and 18.4 in 1984. A number of studies have demonstrated that the high incidence of infant death among blacks is due to their lower socioeconomic state. Simply put, poor people have at least two times the risk of giving birth to an infant who will die within the first year of life than their more affluent countrymen.

In the United States the principal cause of infant mortality is low birth weight -- less than 2500 grams (5.5 pounds). Low birth weight may occur because the infant is born too soon (before 37 weeks) or because the infant has grown too slowly within the uterus or both. As birth weight declines, infant mortality increases. The increase is very pronounced in infants between 2500 and 1500 grams and most pronounced in infants below 1500 grams. Not only are these small infants more likely to die, but they are also more likely to show developmental defects and other serious health problems if they survive. When compared to overall infant mortality, the incidence of low birth weight in the United States has declined more slowly -- from 7.6 percent of all live births in 1971 to 6.8 percent in 1981. This 6.8 percent of infants accounted for two thirds of the total infant deaths during the first month of life and approximately 60% of all infant deaths during the first year of life. The very high infant death rate among blacks can be explained to a very large extent by the high incidence of low birth weight infants in this population. In 1982 12.4 percent of black babies weighed less than 2500 grams at birth. This can be compared to 9.1 percent in Americans of Puerto Rican decent and between 6.9 and 5.3 percent for Americans representing other ethnic groups. Of even more concern is the increasing racial disparity which has occurred with time. Between 1973 and 1983, rates of moderately low birth weight infants decreased more among whites than blacks and for very low birth weight infants the rate declined slightly among whites and actually increased among blacks. Again the reason for the discrepancy for the most part is the lower socioeconomic status of blacks. Thus available data strongly suggest that the reason for the relatively high infant mortality and morbidity in the United States is the high incidence of low birth weight infants and that this high incidence occurs mainly among the poor segments of our population. In addition, it appears that there has been very little progress in reducing the low birth weight among the population in the last few years. What are the causes of low birth weight among the poorer segments of our population? There are, of course, many causes. Certainly if the mother's health status is poor she is more likely to give birth to a small infant. Such maternal conditions as diabetes, hypertension (high blood pressure) anemia and other chronic illnesses are associated with low birth weight. Smoking, heavy alcohol consumption and the ingestion of drugs can also result in poor fetal growth. Finally, there is poor maternal nutrition.

There is abundant evidence that undernutrition during pregnancy will result in poor fetal growth and low birth weight. Although it is difficult to quantitate, most experts would agree that a substantial proportion of the mothers who give birth to low birth weight infants have been poorly nourished both before and during pregnancy. Hence one way to lower the incidence of low birth weight among our poorer populations is to insure that mothers are properly nourished throughout their reproductive years. Not only could we save lives and reduce disability but we could save an enormous amount of money and resources. The initial hospital cost for caring for low birth weight infants added to the cost of caring for the increased amount of disability has been estimated to be $15,000 per low birth weight infant in 1984. Even taking into consideration the increased costs of providing adequate prenatal care and insuring proper maternal nutrition, the savings to the nation would be considerable if we could prevent only a small proportion of low birth weight infants. What is the evidence that poor nutrition before and during pregnancy can retard the growth of the fetus and result in lower birth weight? And what kinds of nutritional interventions would be most effective in reducing the number of low birth weight infants among our disadvantaged populations?

Low birth weight is very strongly associated with inadequate weight gain by the mother during pregnancy. The incidence of low birth weight infants is much higher among women gaining less than 12 kilograms (25 pounds) than among those who gain 12 kg or more. The less weight a mother gains during pregnancy (below 25 pounds), the greater her chances of delivering a low birthweight infant. Weight gain is directly related to maternal diet -- mainly to maternal caloric intake. If a mother is consuming an adequate diet during pregnancy she needs to consume about 250 extra calories per day in order to gain the 25 pounds necessary to lower her risk for delivering a low birth weight infant. If her diet is inadequate, then she will have to consume considerably more than this extra 250 calories. Studies conducted throughout the world have demonstrated that when undernourished populations were supplemented with enough food to increase their caloric intake sufficiently to allow them to gain adequate weight during pregnancy, the birth weight of the infants increased substantially, often more than 250 grams (1/2 pound) on average across the population. Such an increase may seem small but it is worth noting that the average birth weight among blacks and poor people in our population is about 250 grams lower than among whites and more affluent people. Simply stated, if we could increase birth weight by 250 grams among our disadvantaged, the infant mortality could be expected to drop to levels that would place the United States among the countries with the lowest rate in the world. Studies done in Montreal, Canada,have shown that simply providing dietary advice and wholesome food to disadvantaged pregnant women can significantly increase birth weight and reduce infant mortality and morbidity. Studies in our own W.I.C. program suggest the same thing. However, the lack of a nutrition monitoring system when the W.I.C. program was set up and the failure to provide a system of monitoring outcome in the W.I.C. program itself has made the studies done recently difficult to interpret.

Not only must the mother consume more calories during pregnancy but she must also consume more of virtually every nutrient. The requirements for four nutrients specifically increase to a much greater extent than the requirement for calories. These nutrients are the minerals iron, zinc and calcium and the vitamin folic acid. Thus if a mother's diet was inadequate in these nutrients before pregnancy, just providing 250 calories or more of the same diet will not provide sufficient quantities of these nutrients. In the case of iron, the requirement increases more than 300% during pregnancy due mostly to the increase in blood formation in both the mother and the fetus. When this is coupled with the fact that iron deficiency is present in more than 30% of women of childbearing age and that the incidence is substantially higher among poor women, most physicians and nutritionists will routinely supplement all pregnant women with iron during pregnancy unless there is a specific medical reason not to do so. To a lesser extent the same is true for folic acid (one of the B complex vitamins). During pregnancy the requirement for this vitamin doubles. Again deficiency is very common among women, particularly poor women in the childbearing age. Therefore most physicians will supplement all pregnant women with folic acid. In fact, this provides the major justification for the routine use of a daily prenatal vitamin pill. The increased zinc requirement can usually be attained by increasing consumption of foods containing zinc (red meats, poultry, green leafy vegetables and certain types of seafood). The same is true for calcium if emphasis is put on dairy foods. If such dietary modification is impossible, then supplementation with these two nutrients may also be indicated.

During the last few years there has been a great deal of interest in the importance of good nutrition during the prepregnancy period. Many women are planning their pregnancies very carefully. More and more of these women are seeking medical advice before conception. Proper nutrition should be a cornerstone of such advice. By the time prepregnancy is diagnosed, the period of embryogenesis is almost over. It is during this period that the major organs are formed. Therefore it is during this period that most severe birth defects develop. Thus anything which is associated with birth defects would most probably exert its influence before a mother even knows she is pregnant. Excess alcohol intake, certain drugs and certain nutritional deficiencies fall into this category. Recent studies have indicated that certain types of birth defects may be associated with both zinc and folic acid deficiency. Thus if a diet rich in these nutrients and the consumption of a vitamin/mineral supplement containing these nutrients is to be most effective it should be started before pregnancy is diagnosed. There is some evidence that this approach has been very successful in a particular population; women who have already given birth to infants with a severe complex of birth defects known as neural tube defects. These include hydrocephalus (accumulation of fluid within the ventricular system of the brain), anencephalus (absence of most of the brain tissue), meningomyelocoel (faulty closure of the spinal tube); and other severe central nervous system defects. The probability of giving birth to a second child with such a defect is much higher than the incidence of such defects in the general population. Supplementing such a population with either folic acid alone or a multivitamin preparation containing folic acid 28 days before conception And continuing throughout pregnancy has resulted in a dramatic lowering of the expected number of neural tube defects. Although this problem is presently being intensively studied, the data are strong enough and the consequences of this defect are severe enough to mandate that any woman who has had a previous pregnancy terminating with the birth of an infant with a neural tube defect should consult a physician before becoming pregnant again and should not attempt pregnancy until she has consumed a multivitamin preparation containing folic acid for at least one month.

Undoubtedly other populations exist in which nutritional intervention before pregnancy might lower the incidence of birth defects and early abortion. A system that can monitor the nutritional status of women during the childbearing years would allow such data to be coupled with data relating to the outcome of pregnancy, thereby making it much easier to uncover these populations.

A second reason for the importance of this prepregnancy period is because the amount of weight that a woman must gain during pregnancy to minimize her risk of delivering a low birth weight baby depends on her weight before becoming pregnant. The recommendation for a woman to gain about 25 pounds during pregnancy assumes that the woman is at or near her ideal weight (using the Metropolitan Life Insurance Tables) before she becomes pregnant. Many women, particularly poor women, are considerably below their ideal weight. If they become pregnant they will need to make up the difference during pregnancy. Recent evidence suggests that a woman reach 120% of her ideal prepregnancy weight at term. Thus, if a woman should weigh 100 pounds before pregnancy and if she does weigh that much (or more), she needs to gain about 20 pounds during pregnancy to have the lowest risk of delivering a low birth weight infant. Similarly a woman weighing 150 pounds prior to pregnancy, who is at or above ideal weight, needs to gain 30 pounds or less during pregnancy to reach 120% of her pre-pregnancy ideal weight. By contrast, a woman who weighs 100 pounds but should weigh 120 pounds will need to gain more than 40 pounds. Therefore, to avoid having to gain very large amounts of weight during pregnancy (which may not be either desirable or achievable), underweight women should try to gain weight before becoming pregnant. Since even very obese women must gain some weight (about 15 pounds) during pregnancy and since obesity itself can seriously complicate a pregnancy, an attempt should be made to reduce the obese woman before she becomes pregnant. The importance of nutrition during the prepregnancy period is particularly relevant when we consider adolescent pregnancy. The adolescent must gain weight to sustain her own growth. When this is coupled with the amount she must gain during pregnancy (about 25 pounds), she already needs to gain more than the adult woman (often about 35 pounds). If in addition she is significantly underweight (20-25 pounds) before becoming pregnant, she will have to gain a very large amount of weight during pregnancy (sometimes 55 or 60 pounds) to have the best chance of delivering a normal sized infant. Add to this the fact that many adolescents will deliberately try not to gain much weight during pregnancy and it becomes obvious that the adolescent who is pregnant is at very high risk for delivering a low birth weight infant.

The prepregnancy period is also a very important period for a woman to begin to build up some reserves of nutrients that will be drawn upon during pregnancy. Iron and calcium are particularly important in this respect. In the case of iron, the woman may be already deficient because of her diet and lifestyle. For example, women who are vegetarians, particularly if they are pure vegetarians, may be iron deficient; women with very heavy menstrual flow may be iron deficient; and the same may be true for women who have been constantly dieting and for those who consume large quantities of alcohol. It is therefore important to monitor the iron status of women during their reproductive years and to correct any deficiency before the woman becomes pregnant. As for calcium, pregnancy can be a period when calcium is either actively deposited in maternal bone or actively withdrawn from maternal bone. Which of these alternatives occurs depends to a large extent on maternal calcium intake. During pregnancy calcium absorption increases significantly. However, even with this increased absorption the requirement for dietary calcium increases. The data available at present would suggest that during pregnancy a woman should consume about 1.5 grams of calcium per day to ensure adequate calcification of fetal bone at no expense to her own bone. In fact, some evidence suggests that if this much or more calcium is consumed both fetal and maternal bone will retain calcium. Thus pregnancy can be a time when the mother can lower her risk for osteoporosis, the dreaded bone disease so common in older women. But these benefits will accrue only if maternal calcium intake is adequate. If not, the mother will suffer first, losing calcium from her bones to supply the infant's needs. However, if calcium and vitamin D intake are very low (vitamin D is necessary for proper calcium absorption) then the fetal skeleton may be inadequately calcified. Studies in recent years in England have shown that poor calcification of bones and teeth in newborn infants of poor Indian and Pakistani immigrants consuming a low calcium diet is quite common. The same is probably true in the United States. However, there are few data available that have quantified the intake of calcium and vitamin D among poor pregnant women. A good nutrition monitoring system on a national scale could provide such data.

Finally, the prepregnancy period is the time to discontinue those practices, both nutritional and nonnutritional, which can be detrimental during pregnancy. Alcohol should be discontinued during this time; smoking should be stopped; no drugs should be consumed unless necessary for health reasons and then only under a physician's supervision; megadoses of vitamins and minerals should be discontinued. Waiting until pregnancy is diagnosed may be too late both because the strain of pregnancy may make it more difficult to initiate some of these changes and because the period of embryogenesis,when some of these changes may have their greatest impact,has already passed.

Diet and Lactation

Breast feeding has shown a dramatic increase during the past 15 years. In 1971 about 25% of mothers elected to breast feed all. In 1984 more than 60% of mothers elected to breast feed initially. In the next section the discussion will focus on the importance of breast feeding to the young infant. This section will address the nutritional needs of the mother who is breastfeeding.

In order to produce the 600-800 ml. of milk that a breastfeeding infant consumes each day the mother should expend about 1000 extra calories. The available data suggest that she actually expends considerably less energy to produce this quantity of milk. Somehow energy is more efficiently utilized by the lactating woman. The mechanism(s) by which this occurs is presently not understood. Even with this increased efficiency, the quantity of breast milk produced will decline when not enough energy is available. This will occur when maternal fat stores are low, in part because they were not adequately deposited during pregnancy and when maternal calorie consumption is inadequate. Thus it is very important for the lactating mother to consume a diet which is adequate in calories (about 400 calories per day more than the lactating mother). In addition to consuming sufficient calories it is also important that the mother's diet is adequate in other nutrients since for most nutrients the level in breast milk depends to some extent on the level in the mother's diet. It is amazing that so little is known about how specific nutrients are transferred from the maternal circulation into her breast milk. Until this has been worked out for each nutrient it will remain difficult to set exact requirements for many nutrients during lactation. The present RDA's for most nutrients during lactation are only approximations based on what is now known. Hence more research remains to be done in defining more precisely maternal nutritional requirements during lactation. At present the best advice that can be given is to consume a varied diet that contains about 400 extra calories per day. In addition, most physicians will continue the prenatal vitamin during the lactation period. Whether this is really necessary and if so, whether the standard prenatal preparation is appropriate, is not known.

Infant Feeding

There are only two foods suitable for a newborn infant, breast milk or artificial formula. The best food for the human infant is human milk. It provides appropriate amounts of energy and nutrients. It provides factors that protect the infant from infection and help the infant's organ systems mature properly. It contains enzymes which help the infant digest some of the nutrients it provides. And it rarely causes allergic responses. Human milk changes composition as the infant grows older and even during a single feeding the composition of foremilk is slightly different from hind-milk. For example, protein content of human milk decreases from the first week to the sixth to ninth month. During that same period the concentrations of iron, copper and zinc also decrease. Human milk, like most mammalian milk, is a very high fat food. Fifty percent of the calories in human milk are derived from fat. Human milk is also rich in cholesterol, averaging about 20 mg/100 ml. The carbohydrate source in human milk, as in almost all mammalian milk, is lactase. The protein content of human milk is much lower than many other mammalian milks; 1/3 that of cow's milk. Human milk from an adequately nourished mother contains all of the essential vitamins and minerals with the exception of vitamin D. The major nutritional advantages of breast milk when compared to commercial infant formulas are the following:

(1) The protein is very different. Human milk contains 70% whey protein and 30% casein. Cow's milk and many infant formulas contain the reverse. In addition, the amino acid composition of the proteins in human milk differs from the composition of the proteins in infant formula. So that even if an infant formula has the same whey to casein ratio as human milk the makeup of these proteins is different.

(2) Human milk has a preponderance of saturated fat and is relatively high in cholesterol. Infant formulas contain unsaturated fat and no cholesterol.

(3) Human milk contains significant quantities of certain free amino acids, such as taurine, which are not present in many infant formulas (although certain companies have recently added taurine to some of their formulas).

(4) Human milk contains an enzyme (lipase) which helps digest the fat as it passes through the infant's gastrointestinal tract.

Perhaps more important than the nutritional advantages of human milk are the antiinfective properties which it carries. First, there are specific antibodies (IGA) which are present in colostrum (the milk secreted during the first few days) and to a lesser extent the milk itself. Second, there are cells which are part of the mother's already mature immune system which are passed through her milk to her infant throughout the period of breast feeding. Third, there are specific factors which inhibit the growth of certain bacteria and stimulate the growth of others. The net result of all of these antiinfective properties of human milk is that the breast-fed infant is much less prone to infections of the gastrointestinal tract (such as diarrhea) and of the respiratory tract (such as bronchitis or pneumonia) than the formula fed infant. The more research that is carried out investigating the composition of breast milk, the more we uncover about the wonders of this substance. Although sixty percent of American women elect to breast feed initially, forty percent do not. Why? The answer is neither simple nor entirely clear. Some because they feel it is less convenient. Some because they think it will affect their later appearance; some because they have heard that it will increase their risk for breast cancer, some because they are afraid of failure and some for a variety of other equally untrue reasons. It is extremely important that this recent trend in increasing initial breastfeeding be sustained and extended to our poorer populations. Unfortunately the poor do not initially breastfeed as much as the rich. Rates of breastfeeding are highest among mothers who have had some college education, are from upper income families, are not employed outside the home or who are able to take maternity leave and who have just delivered their first baby. Although the trend is positive for initial breastfeeding, it is not so positive for sustained breastfeeding. In a study done in 1984, only 27.5% of women were still breastfeeding by the time the infant was six months old. It is very important to the health of our youngest citizens for breastfeeding practices to be monitored and for breastfeeding to be encouraged on a national scale and among all ethnic groups.

Infant formulas, while not as good as breast milk for the very young infant, have been shown to sustain normal growth and development if they are properly formulated and appropriately used. Since many women still do not breastfeed and since most women have given up breastfeeding before six months, it is imperative that infant formulas be as complete as possible. With few exceptions the quality of the formula itself is very good. Problems. however, have arisen and continue to arise because of poor preparation. In developing countries the water which is added may be contaminated, refrigeration is lacking and overdilution is common to save money. Some of these problems are also present among the poorer uneducated segments of our own population. Severe protein calorie malnutrition during the first six months of life is still the number one cause of infant mortality and morbidity in the world. In the United States, while it is not as frequent as in the developing world,it still exists. How frequent does this totally preventable disease occur in the United States? We do not know! There is no adequate mechanism in place to monitor the nutritional status of very young infants on a national scale. In this country no infant should be malnourished because of inadequate food, inability to breastfeed or faulty preparation of an infant formula. Severe protein calorie malnutrition coupled with the conditions of poverty and deprivation which often accompanies it, cannot only result in death but will often result in brain damage to the survivors. Evidence gathered during the past 25 years from laboratory studies and studies in a variety of populations throughout the world bears this out. Children who have died from severe early protein calorie malnutrition have smaller brains, with fewer cells, fewer nerve connections and less well insulated nerve fibers. Animal experiments have shown that these changes are permanent, persisting into adult life. Those who survive will show retarded development with a loss of motor and sensory skills and a reduced intelligence quotient. Their performance in school is substandard and their ability to perform meaningful jobs reduced. Thus the cycle of poverty and poor nutrition is likely to repeat itself, the survivors unable to extricate themselves and their families from the conditions which led to the problem in the first place. Clearly this problem cannot be prevented by good nutrition alone. However, providing proper nutrition for young infants is one way, at least, to interupt the cycle. Given the alternative there is no other choice.

The Women, Infants and Children's program (WIC) was designed to help solve this problem. There is every indication that when operating efficiently it is working. However, the outcome of infants who have been in the program has not been monitored at a national level, a deficiency which perhaps this bill can help correct.

The Preschool Child

During the toddler or preschool years as growth proceeds at a steady rate, several nutritional problems are common. Because the volume of the child's blood is constantly expanding to keep pace with the increasing body size, the child's iron requirement is increasing progressively. Iron deficiency will occur if this requirement is not met. Iron deficiency is quite common among children in this age group, particularly among those who are from poor families. The exact incidence of iron (and other mineral) deficiency in this population is not known. The consequences of such deficiency, particularly if it is severe, however, are known. Young children with severe iron deficiency are lethargic, inattentive, and uncooperative, and often exhibit pallor and even weakness. Some studies have shown that among children entering school in inner cities as high as 25% are iron deficient. Studies in preschool children have also uncovered another mineral deficiency which is quite common; zinc deficiency. At present, the extent of this deficiency nationally among preschool children is not known. Finally, the problem of childhood obesity often begins in this age group. In a later section, I will discuss childhood obesity in detail. However, it is important to note here that the disease is increasing in frequency and is prevalent among both poor and affluent populations.

The School Age Child

Iron deficiency continues to be the most prevalent nutritional disease among school age children. Many studies have shown that children with iron deficiency, particularly those with iron deficiency anemia have short attention spans and do poorly in school. Treatment with iron will produce dramatic improvement and consumption of a diet rich in iron will sustain that improvement. Although it is well known that iron deficiency is more common among children from poorer segments of our population, the exact number of such children nationally is not precisely known and no mechanism exists for correcting the deficiency if it is uncovered during large scale surveys.

A practice that occurs mainly among preschool children and young school age children is pica (the ingestion of inappropriate, often bizarre, substances). For example, some children will chew paint or lead from batteries, leading to lead poisoning. This practice is more common among children from deprived backgrounds and there is some evidence that it is more common among children with iron deficiency.

Adolescence

Because of rapid growth, changes in body composition and profound endocrine changes, the adolescent is particularly sensitive to poor nutritional practices. Ironically, it is during this period of life that some of the worst nutritional practices occur. Growth during adolescence is faster than at any other time except before the first year of life. Therefore all nutrient requirements increase. Iron deficiency is again extremely prevalent during this period as is zinc deficiency and deficiency of folic acid. In addition the adolescent, particularly the adolescent girl, is prone to obesity. During adolescence a girl will normally change her body composition by depositing a large amount of fat. Typically before adolescence a girl will have 8-10 percent of her tissue as fat. After puberty 15-20% of her tissue will be fat. It is during this period of rapid fat deposition when some girls can become obese. Data presently available suggest that while caloric intake still remains important, nonnutritional factors may also be involved.

Often the life-styles of adolescents dictate certain nutritional needs and create certain nutritional problems. Adolescents, particularly adolescent girls, are often dieting. If caloric intake is low enough a variety of nutritonal deficiencies can occur. Many adolescents like to try different types of diets. Some adopt vegetarian eating patterns without understanding the precautions that are necessary. Those who eat no meat or meat products (only cereals and fruits and vegetables) may develop protein, iron and vitamin B_{12} deficiencies. Many adolescents are involved in competitive athletics and are on a variety of diets designed to increase strength and endurance. Unless these diets are properly conducted a variety of problems can arise. Adolescents make up a high percentage of "fast food" consumers. Their diet is therefore often high in fat, saturated fat, cholesterol and salt (sodium). As will be pointed out in the next section, these dietary practices may lead to health problems in later life.

Two nutritional problems are particularly prevalent among adolescent and young adult women: anorexia nervosa and bulemia. Anorexia nervosa is a disease which is probably psychiatric in origin in which a young woman reduces her intake of food drastically. In some cases almost complete starvation is practiced. Nutritionally, the results may be very serious and the young woman with severe anorexia should be under both psychiatric and nutritonal supervision. However, it is clear that the severe anorexia nervosa we are seeing is the tip of an iceberg. Many young women have milder forms of this disease for which they do not seek medical care. The true incidence of this problem is not known, but some college health directors estimate it as high as 30% among undergraduate women. This is a presently neglected population containing many women who are prone to a variety of deficiencies and who may be at special risk for such diseases as osteoporosis and hypertension later in life. A nutrition monitoring system at a national level could help in detecting these cases and in documenting the deficiencies which occur.

Less frequent but still becoming more common is bulemia. Again adolescent and young adult women are usually involved. In this disease the young woman will eat large amounts at a single sitting (binging) and then induce vomiting. This disease can be more difficult to treat than anorexia and the deficiencies induced can be more severe because it involves not only lack of adequate nutrient intake but actual loss of certain important nutrients, such as sodium, potassium and chloride normally present in the gastrointestinal tract. Again the incidence of this disease, particularly milder cases is not known.

Pediatric Antecedents of Adult Disease*

Atherosclerosis

Although it is clear that a low fat, low cholesterol diet is desirable in adults, the age at which such a diet should be started is presently controversial. A consensus conference held by the National Heart, Lung and Blood Institute after examining the data concluded that at the age of two years it is desirable to begin a a diet consisting of less than 30% of calories as fat; divided equally between saturated, monounsaturated and polyunsaturated fat, and less than 300 mg/day of cholesterol. These conclusions were reached on the basis of evidence that the antecedents of coronary artery disease begin early in life. For example, American soldiers killed during the Korean or Vietnam wars showed evidence in an alarmingly large number of cases of "fatty streaks" within their coronary arteries. Such streaks of fat along the arterial walls are considered by some to be the earliest sign of atherosclerosis, the disease which can progress to a heart attack. Such a diet was considered safe both on theoretical grounds and because a large proportion of the world's children already consume such a diet.

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*This section is taken from an article entitled "Nutrition and Diet" by M. Winick to be published in Health and Medical Horizons 1988, a publication of Macmillan Educational Company.

Shortly after the publication of the report of the consensus committee, the Committee on Nutrition of the American Academy of Pediatrics issued a report of its own concluding that the data presently available did not justify the recommendation that was made. They noted that breast milk and infant formula are very high in fat (about 50% of calories) and that breast milk and cow's milk are very high in cholesterol. In addition, they felt that there were no data demonstrating that a low fat, low cholesterol diet would adequately support normal growth and development in a child. For example, myelination (the deposition of a fat containing insulation around nerve sheaths) is not complete until about age five. The changes associated with adolescence, particularly in girls, are associated with the deposition of large amounts of fat and the hormonal changes in both sexes may involve changes in fat metabolism.

My own position, based on present knowledge, would fall somewhere in between. Certainly if we are interested in preventing atherosclerosis, the earlier we start the better. However, a low fat, low cholesterol diet too early could subtly affect normal growth and development. A particular concern is that some mothers will go well beyond the recommendations and limit fat and cholesterol intake to very low levels (using only skim dairy products, fruits, vegetables and grains). Such a diet could supply too little fat and cholesterol to support adequate myelin deposition. Moreover, reducing fat to very low levels could cause other problems including essential fatty acid deficiency and fat soluble vitamin deficiencies. After myelination is complete (at about age five) might be a better time to institute such a diet. It is at this time when most children begin to consume a diet similar to that consumed by adults. In addition, the amount of milk consumed often drops at this time as calories are available from a greater variety of foods. Thus removing the fat from the dairy products in the diet will still allow some fat to be supplied from the rest of the diet. It should be emphasized that there is no disagreement about whether dietary fat and cholesterol should be limited; it is only the time when limitation should begin that is in dispute. If such changes are instituted at any time during childhood, it is extremely important that their effects be carefully monitored.

Obesity

Perhaps more important, from the standpoint of preventing adult disease, is the issue of avoiding childhood obesity. Again the question is at what age is dietary intervention appropriate to prevent obesity. Here the data continue to accumulate and the answer is much clearer. Studies have shown that a child who is obese (120% of ideal weight) at age three has a sixty to eighty percent chance of being an obese adult. Hence if we wish to reduce the risk of adult obesity we must seek to prevent childhood obesity before age three. This does not mean that caloric restriction should be instituted in all young children. Nor does it mean that any special diet has to be instituted. What it does mean is that any young child whose rate of weight gain is too rapid (as plotted on standard height/weight curves) should reduce his or her caloric intake while at the same time consuming a varied diet so as to insure an adequate supply of all needed nutrients. One good way to do this is to reduce the amount of dietary fat somewhat. Just changing from whole milk to two percent milk can reduce the number of calories significantly. Such a change will have the added benefit of bringing down the total fat intake which in itself may be beneficial as discussed in the previous section.

Osteoporosis

It is clear that the risk of osteoporosis is inversely related to the woman's bone mass. The greater her bone mass, the lower her risk for osteoporosis. Bone mass reaches its maximum by the end of adolescence with very little increase thereafter. Thus any intervention designed to increase bone mass must occur during the growing years. Throughout infancy, childhood and adolescence the body is in positive calcium balance; more calcium is retained than is lost. It is during this period of life, therefore, that adequate calcium intake will ensure maximum calcium deposition into bone.

Thus it is during the childhood and adolescent years that particular attention must be paid to dietary calcium intake. It may be that consuming a diet adequate in calcium during the growing years is much more important in lowering a woman's risk for osteoporosis than taking calcium supplements later on.

Hypertension

Hypertension (high blood pressure) is present in thirty to forty percent of adult Americans. Althouh it is much rarer among children, there is a growing body of evidence that some of its antecedents may begin in childhood. Currently it is believed that some people are prone to hypertension if they consume a diet that is high in sodium. Americans consume such a diet. American children, particularly older children and adolescents, consume a very high sodium diet. Two aspects of this high intake of sodium by children may be important in the development of hypertension in the adult. The first is that a number of studies have demonstrated that a preference for salt (the main source of sodium) is learned. Thus the child exposed to a high sodium diet will "learn" to prefer foods which have a salty taste and hence prefer such foods as an adult. The second is that in animal experiments the longer the exposure to a high sodium diet the greater the chance of inducing hypertension. If this is true in humans it would suggest that some children consuming a high sodium diet may be increasing their risk for adult hypertension.

Testimony for Hearings of The Committee on Governmental Affairs

U.S. Senate

March 1, 1988

Senator Glenn and members of the Committee on Governmental Affairs, my name is Irwin Rosenberg and I am the Director of the USDA Human Nutrition Research Center on Aging at Tufts University, and Professor of Nutrition and Medicine at that University. As a former Chairman of the Food and Nutrition Board of the National Research Council which is responsible for setting our dietary recommendations and standards and as former President of the American Society for Clinical Nutrition, I am well aware of the importance of nutrition and the essentiality of appropriate public policy in respect to the health of the American public, and therefore I am most grateful for the opportunity to make some remarks on nutrition and the elderly at these hearings.

In the two decades since the White House Conference on Nutrition and Health in 1969 and that on Aging in 1971, there has been a gratifying increase in public concern with the importance of diet, nutrition, and their relationship with health and disease. Nowhere is the promise that improved diet and nutrition may contribute to greater health and vitality more compelling than in the case of the growing population of elderly in this country. You are all well aware of the population trends. At the beginning of this century, 1 in 25 Americans was over 65 years of age, this year that figure is 1 in 9 and by the year 2050, statisticians predict that 1 in every 5 Americans will be over the age of 65. Average life expectancy at birth is now 75 years, dramatically increased from 47 years of expectancy at the beginning of this century. It could well be argued that one of the greatest challenges to our social and economic planning is this remarkable change, the graying of our population. While average life expectancy continues to increase as a substantial credit to our progress in health care and nutrition, we cannot lose sight of the fact that 80% of these elderly have at least one chronic condition of which osteoporosis, arthritis, hypertension, hearing and visual impairments, and cardiac conditions, are among the most prevalent. On the average, individuals over the age of 75 years of age make 8 visits to their doctors every year, and in 1985, approximately 5 million elderly in the United States required long term care. That latter number is rising. Thus, one of the great challenges to health science is to examine what it is that we have done successfully to contribute to the steady improvement in life expectancy, to examine the diets and nutritional status of adult Americans as they change with age, and as they reach the extremities of life. We need a broader scientific foundation for making recommendations about the diet and nutritional requirements of elderly Americans, and to determine what may be the optimal diets and nutritional intakes which will allow the greatest number of our elderly Americans to remain vigorous and self-sufficient in their older years.

In the short time available to me, I would like to briefly address several issues. First, what do we know about and what more needs to be known about the nutritional status of our elderly? How does aging per se influence nutritional status? How much do we know about the consequences of poor nutrition on the health and vitality of our aging population? Can we expect diet to influence the decline of organ function which so commonly accompanies aging. Finally, what more do we need to know about nutritional requirements of the elderly and recommendations for healthful diets which will maintain maximum vitality?

To study the nutritional status of the elderly population, three basic methods are employed:clinical studies, dietary studies, and laboratory investigation. Clinical studies evaluate the physical signs of nutritional health or disease. Dietary studies compare nutrient intake with accepted standards, and laboratory investigations provide information about the quantities of particular nutrients in the body in relation to certain biochemical functions.

There are some changes in physiologic functions with aging that can influence food intake and the utilization of nutrients. Cross-sectional studies like those at the Baltimore Center for Aging have shown that organ function tends to decline with age. This includes cardio-respiratory function, musculo-skeletal function, or mental function and memory. Similarly, there is a decline of the sensitivity to taste and smell which can influence, at the extremeties of age, the appreciation of food and thus of dietary intake. In addition, there are changes in the function of the digestive tract which can influence of nutrient absorption and utilization. Among these changes are a diminution in the production of stomach acid in one-third of individuals over the age of 65, which may result in some change in the efficiency of absorption of certain nutrients such as iron, folic acid, and possibly calcium.

A number of status surveys of the elderly population have been performed in the past decade in this country and abroad. The outcome of such surveys is strongly influenced, not unexpectedly, by the location and selection of the survey sample. For example, free-living elders tend to have much more normal nutritional status then do those who are institutionalized; the urban poor and those from minorities show more problems than do samples from Caucasian and middle class populations. The survey recently completed by the USDA Human Nutrition Research Center on Aging at Tufts University showed a declining intake of calories with increasing age that runs parallel to a diminishing body muscle mass and decreasing physical activity. As a result of the decreased total food and calorie intake, there is also a tendency to diminish intake of other elements of the diet, including vitamins and minerals. For those elders with the smallest calorie intakes, particularly those under 1500 calories, it is increasingly difficult to select diets which are fully adequate in all the essential nutrients. Thus, several studies such as the one in Boston have demonstrated dietary intakes of vitamin D ,vitamin B_6, folic acid, calcium and zinc which are questionable for 30-70% of those studied. Clinical and biochemical studies demonstrate vitamin and mineral deficiencies in small numbers of the free-living elderly population, and in a larger percentage of bedridden and institutionalized elders.

As our population ages, it is increasingly important that we answer further questions about the best methods to carry out nutritional screening and assessment of the elderly especially those who reside, in increasing numbers, in nursing homes and other long-term care facilities. Any program of national nutrition monitoring must take into account not only the adequate sampling of the elderly population, but also the monitoring of the nutritional status of the institutionalized and bed-ridden elderly. In addition, it is important that surveillance include those who are living alone who more often present special problems socioeconomically and nutritionally.

In the face of evidence from nutrition surveys that dietary intake declines with increasing age, what can be said about the relationship between dietary adequacy and health and vitality of the elderly population? Medical research has shown us that certain dietary patterns influence the onset or severity of degenerative diseases. A combination of such conditions often results in a chronically ill, dependent elderly person, as opposed to a vigorous and self-sufficient one. We know that proper diet throughout life and in our adult years especially, can influence the onset and expression of adult diabetes. We know that dietary patterns can influence the expression of the tendencies for coronary and arterio-vascular disease and hypertension. There is evidence that diet is one of the factors influencing the onset of osteoporosis of the elderly.

At the USDA Human Nutrition Research Center on Aging at Tufts University, we have been interested in nutrition and the maintenance of healthy organ function with age and some hopeful observations have already been made at this federally-funded Center which is only 5 years old this year. Scientists at the center have observed that the loss in the bone density which regularly accompanies age beyond the menopause can be influenced by the dietary calcium intake. The muscle mass and strength, which is reported to decline with age in cross-sectional studies of the elderly, can be maintained with a program of regular exercise. The efficiency of rebuilding muscle after vigorous exercise may be diminished in older persons, but it may well be possible to meet the increased requirements for muscle rebuilding with improved dietary intake, especially of protein in the elderly. The genetic tendencies for abnormal blood cholesterol patterns and increased risk of heart disease and other vascular diseases may be modified by changes in dietary fat intake and even by intake of certain vitamins. Especially exciting is recent work indicating that we can use biochemical markers to identify those individuals who utilize dietary fats in different ways and thereby identify those who particularly need to modify their diets. Changes in the opacity of the lens of the eye, or cataract, results in declining vision or blindness in 50 million elders around the world. In this country we perform 700,000 cataract operations annually. Our scientists have observed that the process of cataract formation may be able to be modified by the dietary intake of certain antioxidant substances such as carotenes and vitamin C. A delay in cataract onset by 10 years would result in as much as a billion dollars' saving in annual health costs. While memory loss with aging involves many factors, deficiencies of certain nutrients are known to result in reversible impairment of mental function. For example, deficiency of vitamin B_6, a problem nutrient in our surveys of the elderly, results in some loss of cognitive function.

As we examine the dietary intakes of elder Americans, we recognize that we need to know a great deal more about what is an optimal intake and where dietary patterns should be changed so as best to maintain vitality in the elder years. We need better data on the changing energy and protein requirements of aging Americans so as to be able to meet those needs most appropriately. We need to modify the Recommended Dietary Allowances so that the special needs of the elderly are considered rather than using figures which are extrapolated from studies in younger adults. That will require more direct studies on older individuals. We need to better define the health goals which underly our dietary recommendations. Ideally, we need to be able to describe the dietary requirements for expected degrees of physical and intellectual vitality.

It would be unwise, and almost certainly inaccurate, to expect that the "fountain of youth" and vitality will be found simply in dietary recommendations. Genetic, environmental, and other physiologic factors will influence changes in health and vitality with aging. However, we have shown in the past two decades that we can influence the morbidity and mortality from major degenerative diseases such as heart disease by a combination of changes in habits of diet, smoking, and health care. This should lead us to extend our efforts in the direction of timely information on nutritional status in relation to nutritional requirements in the elderly. We need more research on the way in which meeting those requirements can influence the expression of the aging process. The return on these investments in monitoring and research could be enormous.

TESTIMONY OF JOHN W. BODE

ASSISTANT SECRETARY FOR FOOD AND CONSUMER SERVICES

U.S. DEPARTMENT OF AGRICULTURE

Mr. Chairman and members of the Committee, I am John Bode, Assistant Secretary for Food and Consumer Services for the U.S. Department of Agriculture. I would like to thank you for the opportunity to discuss the Department's nutrition monitoring activities and to comment on S.1081, the National Nutrition Monitoring and Related Research Act. I am pleased to join with our fellow nutrition monitoring collaborators at the Department of Health and Human Services (DHHS) to share with you the progress we are making and our vision for the future of the Nutrition Monitoring System.

Last September, the U.S. Department of Agriculture (USDA) and DHHS submitted a Joint Operational Plan for the National Nutrition Monitoring System (NNMS). This plan, covering 1987-1996, is our update of the 1981 Implementation Plan mandated by Congress (as called for in S. 1081 Title I, Sec. 102(a)2). The new Operational Plan describes three broad goals for us to work toward during this ten year period. They are: achieve a comprehensive system through coordination among NNMS components; improve information dissemination and exchange; and improve the research base for nutrition monitoring. I believe these goals address most, if not all, of the purposes stated in the Bill you are considering.

My remarks today will cover the activities USDA is committed to performing and how these contribute to the goals of the NNMS Operational Plan. First, how are we achieving a comprehensive system through coordination of the NNMS components? The Appendix Table I of the Operational Plan lists the many components of the

NNMS by the type of data they provide. For your convenience, I have included with this statement, a temporal chart showing only USDA's surveys and the National Health and Nutrition Examination Survey (NHANES) of DHHS (Attachment I). The Human Nutrition Information Service (HNIS) is the lead USDA agency for nutrition monitoring. Up to now, the coordination emphasis has been on the major monitoring activities, USDA's Nationwide Food Consumption Survey (NFCS). Much progress has been made here. For example, NFCS-87 (currently in the field) and NHANES III, scheduled to begin later this year, will use a single food-coding system and nutrient data base that is maintained by USDA.

The questionnaires used in recent NHANES and tentative changes proposed for use in NFCS-87 were compared prior to the beginning of the NFCS-87 data collection. Thirty-eight variables were studied by a joint working group from USDA's HNIS and DHHS's National Center for Health Statistics (NCHS). For many of these variables, little or no difference existed between the two questionnaires. Improvements were made to attain closer linkage where possible.

For a few variables, i.e., definition of income, there were conceptual differences related to the different purposes of the two surveys. This should not be viewed as a weakness. NNMS provides data for many different purposes. It is not possible to design a single survey that will adequately meet the divergent needs of these two surveys. Recognizing these differences is essential and we have documented the changes we made in the NFCS 1987 questionnaire.

Another joint working group reviewed the dietary intake methodology used by both NFCS and NHANES -- the 24-hour recall -- for comparability and suggested changes. These included use of the same food codes and nutrient data base for both surveys and addition of the NFCS set of measurement aids to the NHANES set of models.

Once again, identical procedures were not possible because of fundamental differences in how these surveys are conducted. A report of the suggestions and how they might be implemented is available.

Improvements in data reporting will also be put in place with NFCS-87 and NHANES III. For example, the same age groupings will be used by both as well as similar documentation formats for both printed reports and data tapes. This review process for comparability will begin again as we examine the proposed NHANES III questionnaire and the 1989 Continuing Survey of Food Intakes by Individuals (CSFII) for comparability with NFCS-87.

Now, our task is to improve our coverage of monitoring activites. To facilitate this, DHHS and USDA are establishing the Interagency Committee for Nutrition Monitoring (ICNM) chaired by the Assisstant Secretary for Health, DHHS, and the Assistant Secretary for Food and Consumer Services, USDA (as called for in S. 1081, Title I, Sec. 101(c)). This will be a parallel group to the Interagency Committee for Human Nutrition Research (ICHNR). The new ICNM will have representatives from each of the USDA and DHHS agencies involved in monitoring activities as well as representatives from the Department of Defense (DOD), the Department of Commerce (DOC), the Department of Labor (DOL) and the Veterans Administration (VA). We envision that the ICNM will set up working groups to address specific topics and will interact closely with the ICHNR.

We already have a draft of the NNMS Directory (as called for in S. 1081, Title I Sec. 103(b)11) which describes the various NNMS activites in detail. This should be a useful tool for interested parties inside and outside the Federal Government.

The Operational Plan points out two other important objectives as part of the coordination goal - improved timeliness and coverage of high risk individuals, both of which are addressed in S. 1081. USDA has designed the CSFII with these goals in mind. This survey was initiated in 1985. We have completed two years of data collection from specific high risk groups -- women 19-50 years of age and their children 1-5 years of age, including a separate low-income sample as mandated by the 1985 Food Security Act. A sample of men, 19-50 years of age, was included in 1985.

The first results of the 1985 CSFII were released six months after data collection was completed. By this July, less than two years after the completion of the 1986 data collection, we plan to have completed release of all reports and data tapes from both the 1985 and 1986 surveys. We are extremely proud of this new effort and its timeliness record.

It is the first attempt to assess a national sample on a continuous basis ever initiated in this or any other country. The ability to track and forecast dietary problems on a continuous basis is increasingly important as Americans respond to shifts in variables that affect diet, such as employment, family makeup, income, and perceptions about diet/health relationships. The CSFII results have already been useful to USDA and others in formulating and justifying policies relating to food production and marketing, food assistance programs and dietary guidance. For example:

- Nutrient distributions of 4-day dietary intakes suggest that folacin, iron, zinc, vitamin B-6, magnesium and calcium pose the greatest dietary problems for women. These are the same six problem nutrients identified in the 1977 NFCS. These findings are true regardless of income.

- Most children studied, especially among those 1-3 years, failed to meet the RDA for iron, zinc and calcium.

- Appropriate targeting of the Food Stamp Program was shown: households receiving food stamps fared as well or better nutritionally as those food stamp eligible households who were not program participants. This was despite the fact that the households participating in the Food Stamp

Program had lower incomes than the eligible but non-participating households.

- Changes in eating patterns were apparent when the 1985-86 data were compared to the 1977-78 NFCS. Women were eating more low-fat milk and less red meat. The overall percentage of calories from fat declined to 36%. The change in meat consumption was most dramatic for high-income women. Interestingly, they did not reduce their portion of calories from fat, because they got more of their fat from creamy desserts, salad dressings, table fats and cheeses for the nutrient dense red meat.

- Consumption of 300 milligrams or less of cholesterol, as suggested by the National Heart, Lung and Blood Institute, was achieved in 62 percent of the women's 4-day diets.

- Only 12 percent of women had fat intakes over four days that furnished less than 30 percent of calories; 33 percent had diets with fat providing less than 35 percent of calories. Those women whose diets were below 35 percent of calories from fat had lower mean intakes of calcium, iron and zinc than other women had.

The CSFII will be reinstated in 1989. The survey has been redesigned to support moving-average reporting as a cost-effective means of providing trend information in a timely manner. The moving-average approach, recommended by two

National Academy of Science's committees, will be used in CSFII to provide annual estimates of three days of dietary intakes for all sex-age groups. This approach is one required by S. 1081 as well (Title I, Sec. 103(b)2). The collection of three days of intake data is an important aspect of all USDA surveys. One-day intakes are appropriate for estimating mean nutrient intakes by population segments. However, research indicates that data on individual food intakes for at least three days are needed to assess the proportion of the population meeting standards such as the Recommended Dietary Allowances.

Another aspect of the CSFII is a first. The CSFII has been designed to accommodate modules from other agencies with concerns relative to nutrition monitoring. A cooperative effort among HNIS, DHHS's Food and Drug Administration (FDA) and USDA's Food Safety and Inspection Service (FSIS) was established to conduct a survey on consumer attitudes on diet/health issues as a followup to the 1989 CSFII. This project represents the first time that a nationwide sample will be used to study the relationship between individuals' actual dietary intakes and their attitudes about dietary behavior. Such cooperative ventures build on the FDA experience in conducting attitude surveys and HNIS experience in conducting food consumption surveys.

NFCS data collection began in April 1987 for the comprehensive 1987 NFCS, a survey required by S. 1081, Title I, Sec. 103(b)1. In addition to data on intakes of individuals, the decennial survey includes information on the foods used by households during a seven day period and the cost of those foods. Food intake and food price data from this survey will form the research basis for a new revision of the Thrifty Food Plan -- the basis for Food Stamp Program allotments. A computerized model will be used to form the food plan which minimizes deviation from food consumption patterns of low-income households from the survey while meeting nutritional specifications at given costs. The data being collected are generally comparable to those collected in NFCS 1977-78. We are conducting a study to assess the effect of procedural and data base changes between NFCS 1977-78 and NFCS 1987 on food intakes reported by individuals in the surveys; we call this a "bridging survey." We expect the first reports on NFCS to be out by late 1988 or early 1989.

CSFII, with its yearly data collection and reporting, is both economical and flexible. It maximizes staff productivity and provides a flexible structure into which topical issues and methodological investigations can be incorporated. The combination of the decennial surveys (NFCS) and the other smaller continuous surveys has several advantages. The decennial surveys will provide data from sufficiently large groups to study differences among population segments with regard to socioeconomic factors associated with food consumption and expenditure patterns. The smaller surveys will be used to monitor trends in food intakes by the general and low-income populations. The option is available to target additional high risk populations on a yearly basis.

In designing these surveys and their questionnaires, we contacted over 300 government agencies and individuals in academia, industry and public health nutrition for input, in addition to the close collaboration with NCHS described earlier.

The second goal of the 1987 Operational Plan is to improve information dissemination and exchange, again a goal covered by S. 1081. The Departments have implemented a reporting system that integrates the results of the monitoring system components into common reports. The first report to Congress on the nutritional status of the population was made in 1986 by a Federal advisory committee (Joint Nutrition Monitoring Evaluation Committee) jointly sponsored by USDA and DHHS. This report provided baseline data for dietary status and health status. Plans for a second report have been initiated by a joint USDA and DHHS steering committee. The report will include an update on the dietary and nutritional status of the U.S. population based on survey data released since publication of the first report. It will also include an indepth analysis on nutritional factors affecting cardiovascular disease and iron nutriture. The Life Sciences Research Office (LSRO) of the Federation of American Societies for Experimental Biology (FASEB) is preparing the scientific evaluation and interpretaion of NNMS data. An ad hoc Expert Panel on Nutrition Monitoring, composed of persons outside the Government who represent a variety of disciplines, including agriculture economics, nutrition, behavioral science, epidemiolgy, public health and statistics, was selected by LSRO and has begun working. Through the joint steering committee, USDA has briefed the Expert Panel on USDA monitoring activities and on results from the CSFII. We are providing analytical support also. We expect the LSRO report to be ready in

April 1989. It will be used by the Assistant Secretarys' in preparing the report to Congress. A similar reporting system is required by S. 1081 (Title I Sec. 102(a)8).

We are continuing to work with state and local groups interested in nutrition monitoring to increase the usefulness of our data to them. USDA and DHHS participated in several workshops sponsored by the Association of State and Territorial Public Health and Nutrition Directors (ASTPHND) during 1986 and 1987. These were practical sessions designed to improve the state and local personnel's knowledge of the NFCS, CSFII and NHANES data files. Such activities are called for in S. 1081 (Title I, Sec. 102(a)7).

We currently sponsor the National Nutrient Data Base Users group which meets annually to discuss issues pertinent to this food composition data base. Later this year, we plan to begin an NFCS User's group along the model of the NHANES User's group sponsored by FDA. These groups bring data users together for the purpose of learning more about how to use these large data bases effectively.

At the same time, such gatherings give USDA an opportunity to receive valuable input for improvement of the data system. However, we are aware that many interested individuals and groups may not have easy access to up-to-date information about the NNMS. We are exploring several ways to communicate our activities more widely in an efficient and cost effective manner.

USDA continues to provide indepth analysis of the CSFII and NFCS data bases with specific emphasis on policy relevant issues, including those relating to agriculture, food assistance, and nutrition education. Most of this work is done through competitive cooperative aggreements with universities. Eight such studies are underway using the 1985-1986 CSFII and the three new agreements have recently been signed using data from the household food use portion of the 1987 NFCS. A list of research project titles and the cooperators is attached (Attachment II).

The final goal of the 1987 Operational Plan is to improve the research data base for nutrition monitoring, again a point addressed by S. 1081. A subcommittee for nutrition monitoring research has been formed within the ICHNR under the direction of the Deputy Assistant Secretary for Health (Disease Prevention and Health Promotion), DHHS, and the Deputy Assistant Secretary for Food and Consumer Services, USDA. The committee is made up of representatives from HNIS, Agricultural Research Service (ARS), FDA, NCHS, Center for Disease Control (CDC), National Institutes of Health (NIH), VA and DOD. This group is discussing ways to prioritize research needs and coordinate research activities in the high priority areas.

Such a system of identifying and prioritizing research needs works well within USDA. HNIS and the Nutrition Composition Laboratory of ARS have a well organized system of priority setting with respect to food consumption data. Such nutrient data are an essential part of the nutrition monitoring system.

The Department has made significant advances in the past decade in nutrient analyses and the National Nutrient Data Bank. In 1977, reliable nutrient data were available to evaluate the intakes of individuals for calories and 14 nutrients. By 1985, reliable data were available for 28 nutrients. Added nutrients and other food components include many considered to be of public health importance -- cholesterol, fatty acids, dietary fiber, sodium, potassium, carotene, folacin, zinc, copper and vitamin E. Not only has the number of nutrients been expanded, but the quality of the food composition data has increased significantly. This is due to improved methods for laboratory analysis as well as improved sampling on a nationwide basis of those foods that contribute significantly to the intakes of specific nutrients.

Progress in relation to long-term plans for the revision of Agriculture Handbook No. 8 -- "Composition of Foods...Raw, Processed, Prepared" -- continues. To date, 16 of some 22 sections have been published. The remaining six sections are expected to be completed by 1990 with revisions of already published volumes well underway.

One of the primary problems in keeping pace with health and disease concerns is anticipating which nutrients will be a major concern in the future. In 1985, when it was hypothesized that selenium might be a deterrent to cancer, major emphasis was directed towards determining the selenium content of foods. Because the selenium content of a specific food varies depending on where it is grown, this work required a major sampling of foods across the country. However, by 1989-90, we expect to be able to add selenium to the nutrient data base for evaluating intakes from the 1989-93 CSFII.

During the past year, we have begun to focus more closely on possible coordination on nutrition monitoring research priorities at all the ARS Human Nutrition Research Centers. The process includes regular meeting of the Center Directors with the HNIS Administrator and staff. From these informal exchanges, a greater understanding of the problems at hand is achieved. HNIS also works with universities to answer specific research questions. For example, the Department has undertaken 13 major methodological studies in the past 12 years (Attachment III). These studies were designed to increase the validity and reliability of survey results while minimizing costs. They expanded understanding of many survey elements including interview modes (mail, telephone, personal), respondent support needed (probes), measurement aids for more precise estimation of portion size, reliability of surrogate reporting, respondent burden, number and spacing of days to sample, varied sizes of nutrient data base, response errors, and food frequency questions. Several studies were directed at determining the appropriate data collection methodology for CSFII, improving the timeliness of data reporting, and at increasing responses from minorities (blacks, Mexican-Americans, and American Indians and the elderly). A summary of these studies is available. The total cost of these studies was $4,471,000.

It should be clear from these comments that USDA has a serious committment to the NNMS and is working diligently to improve the system in feasible and cost effective ways. The Department's FY'88 budget contains $5,889,000 for monitoring activities carried out by HNIS. Additional human nutrition research is conducted by the USDA through other agencies - ARS and the Cooperative State Research Service (CSRS). A series of budget tables are attached (Attachemnt IV). These tables are part of the 1987 Report on USDA Human Nutrition Research and Education Activities mandated by the 1985 Food Security Act.

S. 1081 would not add to the NNMS in our opinion, rather it would delay further implementation of many of the activities I have described here. As I have already stated, USDA and DHHS have taken a number of steps over the past few years to improve the NNMS. We believe these efforts are completely compatible with the purposes set forth in Section 2 of S. 1081.

There are a number of specific provisions in S. 1081 which we do not support. The bill primarily sets up a management structure for NNMS and details very specific requirements for a comprehensive plan. In addition to the Interagency Board which we have put in place, S. 1081 requires an eleven member Advisory Board and suggests an Administrator. With or without an Administrator and his staff, the requirement of the Advisory Board and the preparation of an annual report by the Board, in addition to a report from the Secretaries will place significant burdens on those agencies responsible for collecting and analyzing the monitoring data.

S. 1081 requires two grant programs to be set up. One is a competitive grants program to "accelerate the development of uniform and cost-effective standards and indicators for the assessment and monitoring of nutritional and dietary status for relating food consumption patterns to nutritional and health status' (Title I, Sec. 102(a)4). The other is a grant program "to encourage and assist state and local governments in developing the capacity to conduct monitoring and surveillance of nutritional status, food consumption and nutrition knowledge and in using such capacity to enhance nutrition services" (Title I, Sec. 102(a)5). Title I, Sec. 105 requires the Secretaries to provide for appropriate scientific research and development by the National Science Foundation, National Aeronautic and Space Administration, National Oceanic and Atmospheric Administration and the National Bureau of Standards, as well.

Perhaps the most onerous portion of S. 1081 is Title I, Sec. 103(b)2, which requires by 1990, a new survey or at least one in addition to NHANES and NFCS. This new survey will be a "stratified probability sample of the people of the United States designed to permit statistically reliable estimates of high risk groups and geo-political area and geographic areas .... I am not sure what several of these terms mean. Is geopolitical area a voting precinct? If so, this will be an enormously undertaking. What are the high risk groups? Earlier in S. 1081, the term was defined as "preschool and school-age children, pregnant and lactating women, elderly individuals, low-income populations, blacks, Hispanics and other groups" (Title I, Sec. 103(a)1). Although the Secretaries are given discretion here, one survey providing statistically reliable estimates for all these categories would be very large.

We welcome ideas from anyone interested in NNMS, but we believe S. 1081 would present serious management burdens and delay improvements in the valuable activities already underway.

S. 1081 also addresses the issue of dietary guidance. At an earlier hearing of this Committee, the subject of dietary guidance was discussed. USDA has a long history of human nutrition researcg and of translating these research findings into usable information for the healthy American public. The Food and Agriculture Act of 1977 (PL 95-113) designated the USDA as the lead agency of the Federal Government for research, extension and teaching in food and agricultural sciences, which by definition, included human nutrition. With this legislation, Congress supported USDA's traditional emphasis on the nutritional needs of normal, healthy individuals rather than the needs of individuals requiring clinical or therapeutic dietary support. In Section 1421, the 1977 Act of the states "It is hereby declared to be the policy of the United States that the Department of Agriculture conduct research in there fields of human nutrition and nutritive value of foods and to conduct human nutrition education activities..."

Within USDA, eight agencies have ongoing programs which promote and implement the Dietary Guidelines for Americans. These agencies and their primary food and nutrition information and education responsibilities are:

- The Extension Service (ES) operates Food and Nutrition Education Programs in partnership with the Cooperative Extension System to disseminate knowledge and applied research directly to the general public. ES also operates the Expanded Food and Nutrition Education Program (EFNEP), a mandated program for low income families and youth.
- The Human Nutrition Information Service (HNIS) coordinates dietary guidance policy, develops research-based dietary guidance materials for the general public, and reports results from its research in food composition, food consumption, and nutrition education to professionals.
- The National Agricultural Library (NAL), through its Food and Nutrition Information Center (FNIC), collects and disseminates information on a wide range of nutritional topics and accumulates and loans nutrition education materials to educators.
- The Agricultural Research Service (ARS) and the Cooperative State Research Service (CSRS) report results from their programs of food and nutrition research usually to professional audiences.

- The Food Safety and Inspection Service (FSIS) is responsible for the safety, wholesomeness and accurate labeling of meat and poultry products and for informing the public on safe handling of these foods.

- The Agricultural Marketing Service (AMS) is responsible for the grading of foods and for the accuracy of promotional materials of some commodity groups.

- The Food and Nutrition Service (FNS) supports the nutrition education components of food assistant programs they administer -- Child Nutrition, WIC, Food Stamp.

- Office of Governmental and Public Affairs (OGPA) provides review and coordination of all food and nutrition information disseminated by USDA.

A more complete description of these activities and the Department's overall nutrition education plans is found in the 1986 USDA Comprehensive Plan for National Food and Human Nutrition Research Program and in the recently released 1987 Report on USDA Human Nutrition Research and Education Activities.

Among our newest activities are:

- a Home Economics Teacher's Guide for teaching the concepts of the Dietary Guidelines, which is now available .

- the National School Lunch Program's recipe card file which has been revised, taking into account the Dietary Guidelines. These will be distributed beginning in late spring.

- the new national initiative of the Cooperative Extension Service that focuses on improving nutrition, diet and health by following the practices recommended in the Dietary Guidelines.

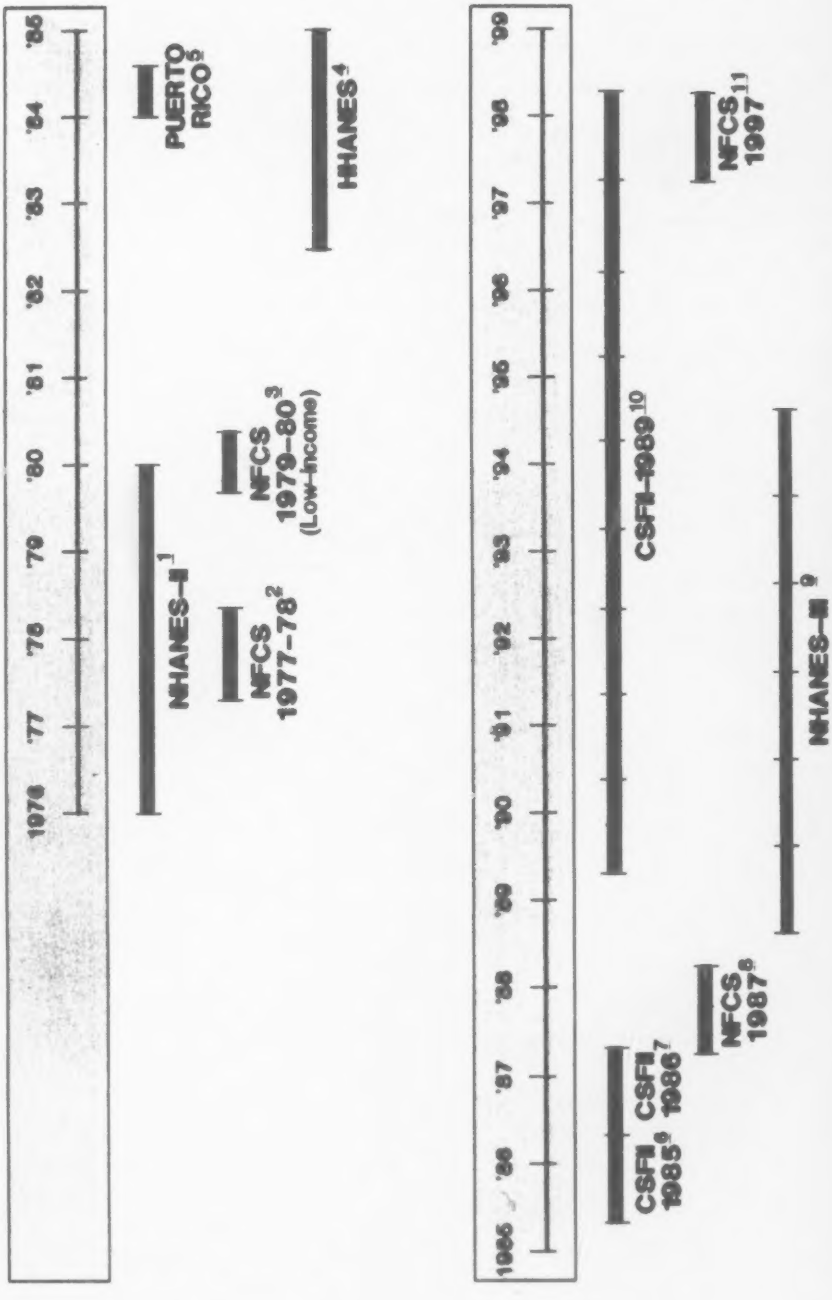
We have taken seriously the direction of the Appropriations Committee of the House to encourage the Federal Government to speak with one voice when issuing dietary guidance. The public needs messages that are not confusing and conflicting if they are to act on them in an appropriate way. To aid in this effort, we have formed a Dietary Guidance Working Group within USDA. This group reviews all guidance from USDA going to the general public to insure its consistency with the Dietary Guidelines for Americans. We believe this has strengthened dietary guidance messages going out to various audiences. We do have a DHHS liaison member to the USDA Working Group and we send a liaison representative to their Subcommittee on Dietary Guidance.

USDA will continue to endorse and promote the Dietary Guidelines for Americans as the best information available for the general public. We have a number of research projects underway to help us deliver the message in more effective ways to various target populations - from school age children to the elderly - low income and upper income. This has been and remains a primary function of USDA.

Mr. Chairman, thank you again for giving me the opportunity to speak with you today. My colleaques and I would be happy to respond to your questions.

ATTACHMENT I

National Nutrition Monitoring Surveys



1/ NHANES II
Probability sample of the civilian, noninstitutionalized population of the U.S. aged 6 months through 74 years, 1 day individual dietary intake.

2/ NFCS 1977-78
Basic -- Stratified probability sample of all private households in the conterminous U.S.; all ages, household food use and 3 days individual dietary intake.

Low-Income -- Stratified disproportionate probability sample of the low income (eligible for food stamps) of all private households in the conterminous U.S.; all ages, household food use and 3 days individual dietary intake.

Elderly -- List sample (provided by Social Security Administration) of individuals 65+ years of age; household food use and 1 day individual dietary intake.

Alaska -- Stratified area probability sample (urban only) of all private households; all ages, household food use and 3 days individual dietary intake.

Hawaii -- Stratified area probability sample of all private households; all ages, household food use and 3 days individual dietary intake.

Puerto Rico -- Probability sample of all private households; all ages, household food use and 3 days individual dietary intake.

3/ NFCS 1979-80
Low Income -- Stratified disproportionate probability sample of the low income (eligible for food stamps) of all private households in the conterminous U.S.; all ages, 3 days individual dietary intake.

4/ HHANES 1982-84
Three samples of Hispanic Americans; i.e., Mexican-Americans (five States in the Southwest), Cuban-Americans (Dade County, Florida), and Puerto Ricans (portions of New York, New Jersey, and Connecticut), aged 6 months through 74 years; 1 day individual dietary intake.

5/ NFCS Puerto Rico 1984
Stratified disproportionate probability sample of all private households; household only.

6/ CSFII 1985
Basic -- Stratified probability sample of all private households in the conterminous U.S. that contained one or more women who were 19 to 50 years of age and their children 1 to 5 years of age; up to 6 days of individual dietary intake.

Low Income -- Stratified probability sample of all private households (at or below 130 percent of poverty) in the conterminous U.S. that contained one or more women who were 19 to 50 years of age and their children 1 to 5 years of age; up to 6 days of individual dietary intake.

Men -- Stratified probability sample of all private households in the conterminous U.S. that contained one or more men who were 19 to 50 years of age; 1 day of individual dietary intake.

7/ CSFII 1986
Basic -- Same as 1985
Low Income -- Same as 1985

8/ NFCS 1987
Basic -- Stratified probability sample of all private households in the conterminous U.S.; all ages, household food use and 3 days individual dietary intake.

Low Income -- Stratified probability sample of all low-income (130 percent of poverty or less) private households in the conterminous U.S.; all ages, household food use and 3 days of individual dietary intake.

9/ NHANES III, 1988-94 -- Probability sample of the civilian, noninstitutionalized population of the U.S. aged 2 months plus; 1 day individual dietary intake.

10/ CSFII 1989+
Basic -- Stratified probability sample of all private households in the conterminous U.S.; all ages, 3 days of individual dietary intake.

Low Income -- Stratified probability sample of all low-income (130 percent of poverty or less) private households in the conterminous U.S.; all ages, 3 days of individual dietary intake.

Data from the CSFII-89+ samples will be reported using a cost-efficient moving-average approach. The first data will be reported following the 1990 data collection.

Low-Income Elderly (planned for 1991) -- Stratified probability sample of all private households (at or below 130 percent of poverty) in the conterminous U.S. that contain one or more persons 65+ years of age; 3 days of individual dietary intake.

11/ NFCS 1997 (planned) -- Same as NFCS 1987.

ATTACHMENT II

Analysis of CSFII 1985 and 1986

Methodological Issues in Food Consumption Surveys

Principle Investigator: Dr. Cheryl Ritenbaugh
University of Arizona

Using CSFII 1985 samples, research is underway to determine components of within-individual variation in nutrient intakes associated with personal, household and demographic attributes as well as survey method. Findings will help in design, of surveys such as in determining number of days of dietary records neededto estimate usual intake of a`nutrient within a given confidence interval for subsets of the population.

Dietary Status and Eating Patterns

Principal Investigator: Dr. Pamela S. Haines
University of North Carolina

This study uses data from the CSFII-85 and the 1977-78 NFCS to examine the relationship between dietary status and eating patterns. Results will help in assessing the role of lifestyle changes including increases in females employment, childlessness and childbearing at older ages on dietary status so that diet and health intervention can be appropriately defined and targeted.

Nutritional Quality of Diets of Population Groups in the USDA CSFII-85

Principal Investigator: Dr. Carol T. Windham
Utah State University

Multiple regression and cluster analyses are being used to identify the personal, demographic and household factors associated with the intakes of and nutrients other food components, using data from CSFII 1985.

Determinants of Food Group Consumption Patterns

Principal Investigator: Dr. Barry Popkin
University of North Carolina

Using data from the CSFII-85 core sample and the 1977-78 NFCS for women 19-50, this study examines associations between personal, household, and demographic factors and reported use of foods.

Health Related Factors Affecting Dietary Status

Principal Investigator: Dr. Gail Harrison
University of Arizona

Using the CSFII-85 core sample, women 19-50, nutrient and food component intake data are being analyzed to determine the underlying multivariant structure using principal component approach.

Relationship of Food Groups and Dietary Intake

Principle Investigator: Dr. Frances Thompson
Cornell University

Using data from women who completed four days of diet records in the CSFII-85, the relationships between consumption of groups of foods and intakes of fat, saturated fatty acids, cholesterol, fiber, sodium, vitamin A and vitamin C are being studied. The results will be used to develop food frequency instruments which can be used to classify individuals by intake of these nutrients and food components of interest the nutrition and health community.

Changing Household Organization and Structure of Demand for Food in the United States

Principal Investigator: Dr. Ellen Bryant
Mississippi State University

Using data from the 1985 CSFII, 4-day, researchers are examining associations between personal, demographic and household factors (particularly household structure), and eating patterns. The effects of these factors on food use and nutrient intake will be assessed using a structural equation model.

Methodological Factors Affecting Measurement of Dietary Status

Principal Investigator: Dr. Stanley R. Johnson
Iowa State University

This study will provide mechanisms for assessing alternative indicators of dietary status. For six nutrients from CSFII data, distributions estimating usual intake are being developed using sophisticated statistical techniques involving data transformations and simulation models.

Analysis of 1987 NFS Household Data

The importance of socio-economic, demographic, and personal factors on nutrient levels of U.S. households

Principle Investigator: Vicki McCracken, Ph.D.
Washington State University

Changes in the structure of the U.S. population and composition of the food supply are thought to be affecting households' food consumption and dietary status. This study will use the household portion of NFSC 1987 to develop behavioral models to identify how socio-economic, demographic and personal factors as well as food product attributes affect the levels of nutrients in households. The results will also be used to forecast future behavioral patterns under alternative scenarios.

The effects of economic, demographic, and food choice variables on household nutrient levels in the United States

Principal Investigator: Suzanne Murphy, Ph.D.
University of California - Berkley

The study will examine the effect of differing economic factors, demographic variables, and food groups choices on the nutrient level of households participating in NFCS 1987 household survey. An economic model will be used to determine nutrient shadow prices that are specific to the survey, region, and level of urbanization. These prices, along with reported food group intakes and a variety of non-dietary variables, will be used to derive parameter estimates for a system of demand equations with a separate equation for each nutrient in the data set. Composite nutrient variables also will be derived to catagorize households and the effects of various economic, demographic, and food choice variables on this classification will be assessed.

An analysis of variations in food consumption across household types and over time

Principal Investigator: Jennifer L. Gerner, Ph.D.
Cornell University

The study will examine the variation in food consumption across different types of households, as well as the variation over time among households of a given type. Using data from the Nationwide Food Consumption Surveys 1977-78 and 1987, households will be divided into mutually exclusive household types, using variables such as race, ethnicity, and household composition. These results will allow prediction of the variation in food consumption across household types, holding economic factors constant. This will allow the extent of the variation due to different preferences, versus that due to differing economic condition, to be predicted.

ATTACHMENT III

USDA/HNIS
Rev. 8/15/85

METHODOLOGICAL DIETARY INTAKE STUDIES CONDUCTED BY U.S. DEPARTMENT OF AGRICULTURE 1978-PRESENT

Year	Study	Description and Main Findings
1977	Survey Design, Inc. "Recommended Survey Design for Validation of Findings of Nationwide Food Consumption Survey 1977-78"	In response to GAO recommendation that NFCS 1977-78 methodology receive further validation, Joseph Steinberg's Survey Design, Inc., developed a research plan which was received favorably by GAO.
1978-80	National Analysts "Further Validation of Results from the 1977-78 Nationwide Food Consumption Survey"	Activation of Steinberg plan included debriefing of interviewers. Panels of respondents discussed methods used, information requested, appropriateness of questions, and ability to provide accurate responses.
1980-82	University of Missouri "Effect of Food Item Specificity on Mean Nutrient Intake Values Reported in Different Sex-Age Groups"	A rationale was developed for reducing items in NFCS spring data base of 4,500 items based on frequency of use and substitutions for less frequently consumed items. Nutrient calculations were compared with baseline data to identify consequences of substitutions on mean nutrient intake values. Researchers concluded that small (500 items or less) nutrient data bases should not be used for analysis of individual dietary records or data from small groups and are not suitable for monitoring specific food consumption practices of a diverse population.
1981-83	University of Michigan "Comparison of Data from NFCS 1977-78 and NHANES I 1971-74"	One-day food, nutrient, and alcohol intakes and height and weight data from the 2 surveys were compared for 11 age groups of males and females, total samples, and by selected stratifying variables using means, medians, percentiles, and frequency distributions. Overall, differences in energy and 10 nutrients between the 2 surveys were greatest greatest for the 2 youngest and 2 oldest age groups. Nearly all NFCS median intakes for oldest groups (51-74 years) were higher than NHANES I values, while for the youngest groups, it was the opposite. More eating

Year	Study	Description and Main Findings
1981-83	Comparison of NFCS 1977-78 and NHANES I 1971-74 (continued)	occasions were shown for NHANES I respondents than for NFCS respondents. Proportion of users of alcohol and their average intake was greater in NHANES I than in NFCS. Overall differences between median heights and weights in the two surveys were small, but differences were greatest in youngest and oldest age groups. Heights were taller for NHANES I youngest age groups but shorter for oldest group than for NFCS groups of the same ages. In NFCS, median weights tended to be higher for males and lower for females than in NHANES I.
1981-83	University of Maryland "Study of Food Intake of Men, 1981-1982"	Study tested (1) ability of working men to accurately recall description and quantity of foods eaten at worksite cafeteria lunch which was unobtrusively recorded, (2) effectiveness of two types of measurement aids—NFCS type measuring utensils and NHANES type models, and (3) surrogate recall of men's intakes. Men, on average, overreported intake amounts using both types of measurement guides, but overreporting was greater with NFCS aids for many foods. Mounds, glasses, cups, bowls, disks were most useful of models, but many models were rarely used. Omitted items were a problem. Surrogate reporting, unless meal was shared, was much poorer than by men themselves.
1981-84	National Analysts "Exploratory Study of Longitudinal Measures of Individual Food Intake"	Nine data collection methods were studied using personal, mail, and telephone approaches or combinations thereof. A panel approach was used, with from one to six contacts during four quarters of 1983. Respondents were females aged 20-69 years, from about 1,700 middle-income households of 2 or more persons. Respondents were the main meal planner/preparer for the household. Analyses of outcome and processing measures revealed that mail methods suffered from very poor response rates and imprecise recording of descriptions and portions eaten. The telephone and personal-contact-switched-to-telephone emerged as most promising methods for panel study with the highest sustained completion rates, required least respondent burden, and less handling in coding and file preparation.

Year	Study	Description and Main Findings
1983-84	University of Missouri "Exploratory Study of Longitudinal Measures of Food Intake: Final Report"	Data from the National Analysts study of the same name were analyzed to evaluate quality of data collected for food items recorded, nutrient contents, and response rates. Mail methods were not acceptable because of response rates below 50 percent, while telephone methods were the most promising. Food energy intakes by the telephone methods generated data best representing energy intakes as collected by all experimental methods. Regressions showed (1) underreporting occurred among females with less than high school graduation and (2) females in smaller households reported higher food intakes than those in larger households. Researchers recommend personal-switched-to-telephone, 1-day recall for use in CSFII 1985 to obtain "best" intake data and maintenance of constant sampling rate.
1985	In-house, USDA/HNIS/NMD "One-day and 3-Day Nutrient Intakes by Individuals—NFCS Survey Findings, Spring 1977"	High correlation was found between intakes in consecutive 3-day periods. Regression analysis indicated that Day 1 intake was strongest as predictor of intake on subsequent days for energy, carbohydrate, calcium, magnesium, and phosphorus; poorest for vitamin A; and intermediate for other nutrients studied. Paper published in J. Am. Dietet. Assoc. 85:313, 1985.
1983-85	Westat "Pilot Study of Measures of Individual Food Intakes of the Low-Income Population"	Primary goal of this study—in response to specific legislation—is to evaluate different methods—mail and telephone approaches—for collecting longitudinal data on dietary intakes of individuals in different segments of low-income population. Personal contact (in first quarter) followed by telephone interview or mail in subsequent quarters are methods to be tested during 1-year study in which four 3-day intake information on household members will be obtained. Household had two or more persons, was eligible for food stamps, and had a female head 20-50 years of age. Groups studied were blacks, Mexican-Americans, Indians, elderly, and whites. Results are due momentarily to show practical problems with these groups.
1983-85	University of Missouri "Development of a Shortened Nutrient Data Base for Dietary Surveys"	Followup of 1980-82 study. Trying for a data base of 2,500 items and testing its effectiveness. To be completed in 1985.

Year	Study	Description and Main Findings
1983-85	University of Missouri "Analysis of Food Consumption Patterns and Diet Status: Methodology Studies"	Several methodological questions are being analyzed: (1) Variability of consecutive-day individual intakes compared to intake records separated by different time intervals (2) distributions of intake for calories and selected micronutrients, (3) mean daily intakes for calories and selected micronutrients and number of days of recorded intake, (4) an analysis of individual intakes from pilot low-income survey, (5) household-level analysis of the intake information from the low-income pilot survey, and (6) a comparison of intake information obtained in the low-income pilot survey with that from comparably defined households in the 1977-78 NFCS and 1977 special low-income survey.
1983-86	University of Michigan "Development and Validation of a Food Frequency Questionnaire"	The purpose of this study is to design a food frequency questionnaire based on about 100 food groups developed from an analysis of NFCS and NHANES I data. Respondents will be asked to estimate how often and how much of each food group or food was consumed during the past year. The estimate of usual diet during the past year will be cross-validated by comparing foods, food groups, and nutrients derived by the food-frequency method to similar data derived from four 4-day reports (1-day recal plus 3-day record), one set collected during each season from each of about 200 respondents 20-50 years of age about equally divided by sex and by race (blacks, whites). Final report due in 1986.

ATTACHMENT IV

Table 2

U.S. DEPARTMENT OF AGRICULTURE
[redacted] NUTRITION RESEARCH, EDUCATION AND INFORMATION SUPPORT (FY 83-88)

HUMAN NUTRITION RESEARCH
($ in Millions)

	FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
ARS	31.7	34.3	36.9	37.8	40.6	44.3
CSRS	7.8	7.7	7.3	7.4	7.5	7.7
HNIS	6.7	5.3	6.0	12.8	6.1	7.7
ERS	0.9	0.7	0.7	1.1	1.2	1.4
FNS	0.7	5.4	1.4	1.5	0.5	0.4
TOTAL	47.8	53.4	52.3	60.7	55.9	61.5

Human Nutrition Education and Information

	FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
ES	76.1	76.6	77.0	73.5	73.5	75.0
HNIS	1.0	0.7	0.7	1.2	0.7	0.9
FNS	42.0	50.5	55.0	57.6	60.4	61.0
FSIS	0.4	0.3	0.5	0.4	0.13	0.12
NAL	0.4	0.4	0.4	0.5	0.4	0.5
TOTAL	120.0	128.5	133.6	133.2	135.1	137.5

	FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
TOTAL RESEARCH, EDUCATION AND INFORMATION	167.8	181.9	185.9	193.9	191.0	199.0

Table 3

USDA NUTRITION RESEARCH PROGRAM SUPPORT (FY 83-88)
($ in Millions)

	FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
1. Nutrient Requirements/ Health Maintenance						
CSRS	2.7	3.3	3.6	3.7	4.8	5.0
ARS	26.4	27.3	26.3	27.5	29.9	31.0
Total	29.1	30.6	29.9	31.2	34.7	36.0
2. Nutritional Status/ Food Intake						
CSRS	2.8	2.8	2.3	2.4	1.4	1.4
ARS	0.7	0.6	2.3	3.1	3.9	3.9
HNIS	3.5	2.6	3.2	9.9	3.2	4.8
Total	7.0	6.0	7.8	15.4	8.5	10.1
3. Use of Food/Food Choices						
CSRS	0.4	0.3	0.2	0.3	0.3	0.3
HNIS	1.7	1.1	1.1	1.1	1.1	1.1
ERS	.6	0.4	0.4	0.8	0.9	0.9
Total	2.7	1.8	1.7	2.2	2.3	2.3
4. Nutrient Composition/ Bioavailability						
CSRS	1.8	1.3	1.6	1.0	1.0	1.0
ARS	4.7	6.5	8.3	7.2	6.8	9.4
HNIS	1.5	1.6	1.7	1.8	1.8	1.8
Total	8.0	9.4	11.6	10.0	9.6	12.2
5. Nutritional Impacts of Programs						
CSRS	0.1	--	--	--	--	--
ERS	0.3	0.3	0.3	0.3	0.3	0.5
FNS	0.7	5.4	1.4	1.5	0.5	0.4
Total	1.1	5.7	1.7	1.8	0.8	0.9
TOTALS						
CSRS	7.8	7.7	7.3	7.4	7.5	7.7
ARS	31.7	34.3	36.9	37.8	40.6	44.3
HNIS	6.7	5.3	6.0	12.8	6.1	7.7
ERS	0.9	0.7	0.7	1.1	1.2	1.4
FNS	0.7	5.4	1.4	1.5	0.5	0.4
USDA Total Nutrition Research	47.8	53.4	52.3	60.7	55.9	61.5

Table 4

USDA FOOD AND NUTRITION EDUCATION AND INFORMATION SUPPORT (FY 83-88)
($ in Millions)

	FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
Extension Service1/						
Extension (Formula est.)	15.8	16.2	16.7	15.9	15.9	16.4
Expanded Food and Nutrition Education Program (EFNEP)	60.4	60.4	60.3	57.6	57.6	58.6
Total	76.1	76.6	77.0	73.5	73.5	75.0
National Agricultural Library						
Food, Nutrition and Human Ecology Staff	0.4	0.4	0.4	0.5	0.4	0.5
Human Nutrition Information Service						
Nutrition Education Division	1.0	0.7	0.7	1.2	0.7	0.9
Food and Nutrition Service1/						
Nutrition Education & Training Program (NET)	5.0	5.0	5.0	5.0	5.0	1.0
Special Supplemental Food Program for Women, Infants and Children (WIC)2/	37.0	45.5	50.0	52.6	55.4	60.0
Total	42.0	50.5	55.0	57.6	60.4	61.0
Food Safety and Inspection Service						
Nutrition Labeling	0.08	0.1	0.1	0.1	0.1	0.1
Nutrition and Sodium Information	0.06	0.1	0.1	0.1	0.02	0.01
Sodium Monitoring Program	0.28	0.1	0.3	0.2	0.01	0.01
Total	0.42	0.3	0.5	0.4	0.13	0.12
USDA Total Nutrition Education and Information	120.0	128.5	133.6	133.2	135.1	137.5

1/ Most funds are distributed to and managed by State agencies.

2/ Estimate of State administrative funds allocated for nutrition education.

Table 5

AGRICULTURAL RESEARCH SERVICE
HUMAN NUTRITION RESEARCH SUPPORT (FY 1983-88)

Estimated Funds (In millions of dollars)

		FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
BHNRC, Beltville, MD	Gross	7.92	7.97	8.00	7.91	8.34	8.42
	Net	6.98	6.98	7.30	7.02	7.41	7.35
GFHNRC, Grand Forks, ND	Gross	5.41	5.72	6.19	6.36	6.66	7.11
	Net	5.06	5.33	5.57	5.64	5.92	6.32
HNCA, Boston, MA	Gross	7.19	9.59	11.35	11.75	12.76	13.68
	Net	6.84	9.12	10.79	11.16	12.12	12.99
CNRC, Houston, TX	Gross	2.95	3.27	3.59	4.43	5.43	7.65
	Net	2.69	2.96	3.23	3.93	4.88	6.99
WHNRC, San Francisco, CA	Gross	3.48	3.81	3.79	3.66	4.23	4.49
	Net	3.05	3.33	3.42	3.25	3.76	3.95
TOTAL, HN Centers	Gross	26.95	30.36	32.93	34.12	37.43	41.35
	Net	24.61	27.70	30.31	31.01	34.09	37.59
Other ARS HN Research	Gross	3.93	3.97	3.88	3.65	3.18	3.01
	Net	3.25	3.27	3.49	3.24	2.86	2.65
TOTAL, Human Nutrition	Gross	30.88	34.33	36.81	37.76	40.61	44.36
	Net	27.86	30.97	33.80	34.24	36.95	40.25

Table 6

AGRICULTURAL RESEARCH SERVICE

OTHER ARS HUMAN NUTRITION RESEARCH SUPPORT (FY 83-88)*
(In thousands of dollars)

		FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
Beltsville, MD	Gross	187.0	187.0	--	--	--	128.7
	Net	155.0	155.0	--	--	--	111.8
Ithaca, NY	Gross	295.5	305.0	551.5	601.3	750.9	765.0
	Net	242.1	246.7	496.6	533.5	675.9	676.0
Wyndmoor, PA	Gross	573.7	580.2	700.5	667.1	303.1	--
	Net	468.6	471.2	630.6	591.8	272.9	--
Peoria, IL	Gross	1,178.5	1,184.4	1,023.8	985.5	982.4	1017.5
	Net	983.7	985.3	921.7	874.5	884.3	898.8
Albany, CA	Gross	1,400.4	1,412.2	1,007.9	959.2	712.7	653.8
	Net	1,157.1	1,161.3	907.5	851.0	641.5	576.3
Athens, GA	Gross	291.4	302.2	149.0	--	--	--
	Net	244.6	249.8	134.1	--	--	--
Hyattsville, MD	Gross	--	--	449.0	433.5	432.7	443.1
	Net	--	--	404.2	384.6	389.5	391.0
	Gross	3,926.5	3,971.0	3,881.7	3,646.6	3,181.8	3,008.1
	Net	3,251.1	3,269.3	3,494.7	3,235.6	2,864.1	2,653.9

* Excludes Human Nutrition Centers

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20250

April 12, 1988

Dr. Eileen Choffnes
Committee on Governmental Affairs
United States Senate
Washington, D.C. 20510

Dear Dr. Choffnes:

I have enclosed spending figures for the various USDA agencies that contribute to nutrition monitoring. We are providing these figures in response to the request made at the nutrition monitoring meeting Wednesday, April 6.

Please call if you have any questions or need additional information.

Sincerely,

Suzanne S. Harris

SUZANNE S. HARRIS, Ph.D.
Deputy Assistant Secretary for
Food and Consumer Affairs

Table 3

USDA NUTRITION RESEARCH PROGRAM SUPPORT (FY 83-88)
($ in Millions)

	FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
1. Nutrient Requirements/ Health Maintenance						
CSRS	2.7	3.3	3.6	3.7	4.8	5.0
ARS	26.4	27.3	26.3	27.5	29.9	31.0
Total	29.1	30.6	29.9	31.2	34.7	36.0
2. Nutritional Status/ Food Intake						
CSRS	2.8	2.8	2.3	2.4	1.4	1.4
ARS	0.7	0.6	2.3	3.1	3.9	3.9
HNIS	3.5	2.6	3.2	9.9	3.2	4.8
Total	7.0	6.0	7.8	15.4	8.5	10.1
3. Use of Food/Food Choices						
CSRS	0.4	0.3	0.2	0.3	0.3	0.3
HNIS	1.7	1.1	1.1	1.1	1.1	1.1
ERS*	.6	0.4	0.4	0.8	0.9	0.9
Total	2.7	1.8	1.7	2.2	2.3	2.3
4. Nutrient Composition/ Bioavailability						
CSRS	1.8	1.3	1.6	1.0	1.0	1.0
ARS	4.7	6.5	8.3	7.2	6.8	9.4
HNIS	1.5	1.6	1.7	1.8	1.8	1.8
Total	8.0	9.4	11.6	10.0	9.6	12.2
5. Nutritional Impacts of Programs						
CSRS	0.1	—	—	—	—	—
ERS	0.3	0.3	0.3	0.3	0.3	0.5
FNS	0.7	5.4	1.4	1.5	0.5	0.4
Total	1.1	5.7	1.7	1.8	0.8	0.9
TOTALS						
CSRS	7.8	7.7	7.3	7.4	7.5	7.7
ARS	31.7	34.3	36.9	37.8	40.6	44.3
HNIS	6.7	5.3	6.0	12.8	6.1	7.7
ERS	0.9	0.7	0.7	1.1	1.2	1.4
FNS	0.7	5.4	1.4	1.5	0.5	0.4
USDA Total Nutrition Research	47.8	53.4	52.3	60.7	55.9	61.5

* See attached page for breakdown of food supply data costs.

	FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 actual
FOOD SUPPLY						
ERS	.01	.01	.01	.01	.01	.01
NASS[1]	6.2	6.5	7.1	6.8	7.3	7.8

[1] Nearly 3/4 of the NASS budget is for crop and livestock estimates. These cost estimates were prorated to a single yearly report as opposed to NASS' monthly and quarterly reports.

HNIS' EXPENDITURES - NNMS, FY 1976-88
($ Millions)

FY	FOOD CONSUMPTION	NUTRIENT DATA	FOOD SUPPLY	NUTRITION KNOWLEDGE AND ATTITUDE	TOTAL
1976					
Intramural	0.50	.65	.07	-0-	4.8
Extramural	3.55	.03	-0-	-0-	
1977					
Intramural	.60	.65	.07	-0-	6.0
Extramural	4.69	-0-	-0-	-0-	
1978					
Intramural	.75	.70	.075	-0-	4.2
Extramural	2.5	.17	-0-	-0-	
1979					
Intramural	.8	.7	.08	-0-	5.3
Extramural	3.5	.24	-0-	-0-	
1980					
Intramural	.9	.7	.085	-0-	4.97
Extramural	3.8	.38	-0-	-0-	
1981					
Intramural	1.1	1	.09	-0-	4.6
Extramural	2.1	.31	-0-	-0--	
1982					
Intramural	1.2	1	.095	-0-	5.98
Extramural	2.8	.81	-0-	-0-	
1983					
Intramural	1.3	1.1	.10	-0-	5.2
Extramural	1.7	.93	-0-	-0-	
1984					
Intramural	1.3	1.1	.10	-0-	7.56
Extramural	4.8	.26	-0-	-0-	
1985					
Intramural	1.4	1.2	.15	-0-	4.6
Extramural	1.7	.22	-0-	-0-	
1986					
Intramural	1.6	1.15	.11	-0-	10.7
Extramural	7.3	.53	-0-	-0-	
1987					
Intramural	1.6	1.2	.11	.05	4.1
Extramural	1.0	.39	-0-	-0-	
1988(projected)					
Intramural	1.6	1.3	.12	.05	6.1
Extramural	2.6	.31		.15	

FY 1976

A. Food Consumption Research		
I. Intramural		$ 500,000
II. Extramural		3,555,800 1/
1. Nationwide Food Consumption Survey 1977-78 (data collection) (National Analysts)	$3,555,800	
TOTAL		4,055,800
B. Nutrient Data Research		
I. Intramural		650,000
II. Extramural		30,000
1. Folacin content of selected processed and cooked foods (University of Alabama)	30,000	
TOTAL		680,000
C. Food Supply		
I. Intramural		70,000 2/
D. Nutrition Knowledge/Attitudes		
I. Intramural		
II. Extramural		
TOTAL		4,805,800

1/ Includes funds from other Agencies.
2/ Excludes National Agricultural Statistics Service (NASS) and Economic Research Service (ERS) costs for collecting and tabulating food supply data.

FY 1977

A. Food Consumption Research		
I. Intramural		$ 600,000
II. Extramural		4,694,100 1/
1. Nationwide Food Consumption Survey 1977-78 (data collection) (National Analysts)	$4,694,100	
	TOTAL	5,294,100
B. Nutrient Data Research		
I. Intramural		650,000
II. Extramural		0
	TOTAL	650,000
C. Food Supply		
I. Intramural		70,000 2/
D. Nutrition Knowledge		
I. Intramural		
II. Extramural		
	TOTAL	6,014,100

1/ Includes funds from other Agencies.
2/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1978

A. Food Consumption Research			
I. Intramural		$ 750,000	
II. Extramural		2,500,000	1/
1. Nationwide Food Consumption Survey 1977-78 (data collection) (National Analysts)	$ 730,627		
2. Tabulation of Nationwide Food Consumption Survey (Federal Prison Industries and L.R. Davis Co.)	1,769,373		
	TOTAL	3,250,000	
B. Nutrient Data Research			
I. Intramural		700,000	
II. Extramural		174,030	
1. Nutrient content of selected fruits and vegetables (National Food Processors Assoc.)	134,030		
2. Folacin content of selected processed and cooked foods (University of Alabama)	30,000		
3. Vitamin B-12 and folacin methodologies (Johns Hopkins University)	10,000		
	TOTAL	874,030	
C. Food Supply			
I. Intramural		75,000	2/
D. Nutrition Knowledge/Attitudes			
I. Intramural			
II. Extramural			
	TOTAL	4,199,030	

1/ Includes funds from other Agencies.

2/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1979

A. Food Consumption Research		
I. Intramural		$ 800,000
II. Extramural		3,489,066
1. Tabulation of Nationwide Food Consumption Survey (Federal Prison Industries and L.R. Davis Co.)	$2,400,000	
2. 1979-80 Low-Income Survey II (data collection) (National Analysts)	700,320	
3. Food Stamp Program effect on food expenditures and quality of diets of low-income households (University of Missouri)	79,713	
4. National school lunch and breakfast programs: participation and dietary impact (University of North Carolina)	148,700	
5. Food consumption patterns in the U.S. population (Anarem Systems Research)	160,333	
	TOTAL	4,289,066
B. Nutrient Data Research		
I. Intramural		700,000
II. Extramural		235,579
1. Nutrient content of selected vegetables purchased in different geographical areas of the U.S. (University of Illinois)	73,423	
2. Nutrient content of selected fruits purchased in different geographical areas of the U.S. (Virginia Polytechnic Inst. and State Univ.)	69,951	
3. Nutrient content of selected mature legumes--raw and cooked (University of Idaho)	92,205	
	TOTAL	935,579
C. Food Supply		
I. Intramural		80,000 1/
D. Nutrition Knowledge/Attitudes		
I. Intramural		
II. Extramural		
	TOTAL	5,304,645

1/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1980

A.	Food Consumption Research		
I.	Intramural		$ 900,000
II.	Extramural		2,901,756
1.	Fieldtesting the use of laptop computers to collect NFCS data (National Analysts)	$ 110,087	
2.	Validation of NFCS 1977-78 dietary intake (University of Maryland)	217,704	
3.	Guidelines for data collections in large-scale surveys (Temple University)	160,390	
4.	Food Stamp Program effect on food expenditures and quality of diet, 1979-80 Low-Income Survey (University of Missouri)	165,125	
5.	Economies of size in household food expenditures and use (Washington State University)	168,919	
6.	Methodology for estimating food losses in U.S. households (University of Arizona)	282,283	
7.	Eating patterns conducive to good health (Swanson Nutrition Center)	215,670	
8.	Effect of food item specificity on mean nutrient intake values for different sex-age groups (University of Missouri)	131,578	
9.	1979-80 Low-Income Survey II (data collection) (National Analysts)	1,000,000	
10.	Food Stamp Program effect on food expenditures and quality of diets of low-income households (University of Missouri)	200,000	
11.	National school lunch and breakfast programs: participation and dietary impact (University of North Carolina)	250,000	
		TOTAL	3,801,756

FY 1980 (continued)

B. Nutrient Data Research		
I. Intramural		700,000
II. Extramural		383,649
1. Nutrient content of selected cereal products (Utah State University)	98,353	
2. Nutrient content of selected home-prepared and institutionally prepared foods (University of Illinois)	168,761	
3. Nutrient content of raw and cooked mixed dishes (Oregon State University	116,535	
	TOTAL	1,083,649
C. Food Supply		
I. Intramural		85,000 1/
D. Nutrition Knowledge/Attitudes		
I. Intramural		
II. Extramural		
	TOTAL	4,970,405

1/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1981

A. Food Consumption Research

I.	Intramural		$ 1,100,000
II.	Extramural		2,107,055
1.	Dietary patterns of individuals and households in Hawaii (University of Hawaii)	$ 85,015	
2.	Effects of eating out practices on diet quality, food expenditures, and shopping practices of U.S. households (University of Illinois)	191,039	
3.	Development and implementation of a preference-maximizing model for computing food plans at different cost levels (Univ. of Massachusetts)	70,840	
4.	Comparisons of data from Nationwide Food Consumption Survey and Health and Nutrition Examination Survey (Univ. of Michigan)	134,207	
5.	Exploratory study of longitudinal measures of individual food intake (National Analysts Division, Booz/Allen & Hamilton)	1,067,454	
6.	Evaluation of differences in household food expenditures between 1971-72 and 1977-78 (University of Wisconsin)	108,500	
7.	Food Stamp Program effect on food expenditures and quality of diets of low-income households (University of Missouri)	200,000	
8.	National school lunch and breakfast programs: participation and dietary impact (University of North Carolina)	250,000	
		TOTAL	3,207,055

B. Nutrient Data Research

I.	Intramural		1,000,000
II.	Extramural		307,960
1.	Nutrient content of selected variety breads, other breads, and pastas (Amer.Inst. of Baking)	40,000	
2.	Determination of content of vitamins and minerals in selected fruits purchased in six U.S. cities (University of Georgia)	85,445	

FY 1981 (continued)

3. Nutrient content of unsprouted and sprouted cereal and leguminous seeds (Univ. of Idaho)...	99,515	
4. Determination of nutritive value of selected foods (University of Massachusetts)...........	15,000	
5. Determination of the nutrient content of fast foods (Virginia Polytechnic Inst. and State U.)	68,000	
	TOTAL	1,307,960
C. Food Supply		
I. Intramural..		90,000 1/
D. Nutrition Knowledge		
I. Intramural		
II. Extramural		
	TOTAL	4,605,015

1/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1982

A. Food Consumption Research		
I. Intramural		$ 1,200,000
II. Extramural		2,875,808
1. Develop criteria for evaluating dietary intakes of individuals from surveys (National Academy of Sciences)	$241,850	
2. Conduct a conference of users of data from the Nationwide Food Consumption Surveys (NAS)	169,900	
3. Conduct a pilot survey of methods for measuring food intakes of individuals in the low-income population (Westat)	1,831,668	
4. Analyze food patterns of low-income households (Kansas State University)	19,992	
5. Identify factors related to nutrient intake and dietary patterns of individuals 55 years and older (University of North Carolina)	314,636	
6. Study the effect of food stamp use and other socioeconomic factors on food use and dietary status of households and individuals (University of Missouri)	130,000	
7. Study the frequency of use of foods from selected food groups as a possible alternative method of measuring dietary status of individuals (Pennsylvania State University)	157,837	
8. Study factors affecting the efficiency of food consumption in households (Cornell University)	9,925	
	TOTAL	4,075,808
B. Nutrient Data Research		
I. Intramural		1,000,000
II. Extramural		816,713
1. Determine the nutrient content of selected variety meats (South Dakota State University)	43,743	
2. Determine the nutrient content of selected seafood products (University of Rhode Island)	50,490	
3. Determine the total lipid and cholesterol content of selected mollusks (Univ.of Connecticut)	37,429	

FY 1982 (continued)

4.	Determine the vitamin and mineral element content of raw and cooked mixed dishes (Oregon State U.)	172,223	
5.	Determine the nutrient content of foods from fish fast-food establishments (Cornell University)....	90,100	
6.	Determine the nutrient content of selected vegetables purchased in six cities in the U.S. (Univ. of Georgia Research Foundation)..........	94,811	
7.	Determine the nutrient content of selected variety and other breads and pastas purchased in major U.S. cities (American Inst. of Baking)....	80,000	
8.	Determine the vitamin, mineral and proximate content and carbohydrate fractions in selected foods (National Food Processors Association)....	90,000	
9.	Review and recommend changes for improvement of measuring the energy content of foods (FASEB, Life Sciences Research Office)................	157,917	
		TOTAL	1,816,713
C.	Food Supply		
I.	Intramural..		95,000 1/
D.	Nutrition Knowledge and Attitudes		
I.	Intramural		
II.	Extramural		
		TOTAL	5,987,521

1/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1983

A. Food Consumption Research		
I. Intramural		$ 1,300,000
II. Extramural		1,748,163
1. Conduct a pilot survey of methods for measuring food intakes of individuals in the low-income population, Phase II (Westat)	$777,505	
2. Study the effect of food stamp use and other socioeconomic factors on food use and dietary status of households and individuals (University of Missouri)	220,349	
3. Development and and testing of food portion measurement guides for use in dietary intake surveys (Case Western Reserve University)	72,425	
4. Development and validation of a food-frequency questionnaire (University of Michigan)	365,255	
5. Development of a shortened nutrient data base for dietary surveys (University of Missouri)	68,943	
6. Utilization of national food consumption data (National Academy of Sciences)	87,100	
7. Use of convenience foods by U.S. households (Virginia Polytechnic Inst. and State Univ.)	43,903	
8. Economies of scale and seasonal variation in household food use (Washington State Univ.)	112,683	
	TOTAL	3,048,163
B. Nutrient Data Research		
I. Intramural		1,100,000
II. Extramural		930,232
1. Mexican fast-food analyses (Univ. of Arizona)	92,862	
2. Nutritional evaluation of solid and liquid portions of selected canned fruits and vegetables (University of Idaho)	99,547	
3. Revision of Nutrient Data Bank (Information Concepts, Inc.)	388,377	
4. Nutrient composition of fried chicken (Kansas State University)	72,494	

FY 1983 (continued)

5. Determination of individual vitamin A-active compounds in foods from several geographical locations of the U.S. (University of Maine).....	49,989	
6. Amino acid composition of foods (University of Massachusetts)................................	100,470	
7. Nutrient composition of cooked separated lean meat and poultry (Univ. of Missouri)...........	54,068	
8. Investigations of the carbohydrate fractions of foods--raw, processed, prepared (National Food Processors Association).........................	72,425	
	TOTAL	2,030,232
C. Food Supply		
I. Intramural...		100,000 1/
D. Nutrition Knowledge and Attitudes		
I. Intramural		
II. Extramural		
	TOTAL	5,178,395

1/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1984

A.	Food Consumption Research		
I.	Intramural		$ 1,300,000
II.	Extramural		3,766,177 1/
1.	Puerto Rico nutrition study (National Analysts)	1,030,033	
2.	Continuing Survey of Food Intakes by Individuals (National Analysts)	2,109,173	
3.	Validation of increased accuracy of NFCS procedures (University of Arizona)	102,937	
4.	Food cost and nutritional status (University of Missouri)	215,775	
5.	Further exploration of form, structure, and sequence of nutrition information for household food managers (Pennsylvania State University)	105,806	
6.	Assessing dietary intake; an analysis of the frequency of use of specific food groups and nutrient content of diets reported in 1977-78 NFCS as a basis for proposed alternate method of data collection (Pennsylvania State Univ.)	82,453	
7.	Improved analysis procedures; and assessment of National Nutrition Monitoring System (Univ. of Maryland)	120,000	
		TOTAL	5,066,177
B.	Nutrient Data Research		
I.	Intramural		1,100,000
II.	Extramural		256,273
1.	Compilation of lipid components of foods (University of Maryland)	120,000	
2.	Nutrient content of cereal products and baked goods (University of Georgia)	78,273	
3.	Provide support for Ninth National Nutrient Databank Conference (Univ. of Massachusetts).	8,000	
4.	Determination of vitamin A-active compounds in foods from several geographic locations of the U.S. (University of Maine)	50,000	
		TOTAL	1,356,273

FY 1984 (continued)

C.	Food Supply	
	I. Intramural	100,000 2/
D.	Nutrition Knowledge/Attitudes	
	I. Intramural	
	II. Extramural	
	TOTAL	6,522,450

1/ Includes funds from other Agencies.
2/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1985

A. Food Consumption Research

I. Intramural		$ 1,400,000
II. Extramural		2,764,644
1. Continuing Survey of Food Intakes by Individuals (CSFII) (National Analysts)	2,415,324	
2. CSFII, males 19-50 (National Analysts)	230,552	
3. Development of methodology for predicting nutrient intake (University of Missouri)	105,705	
4. Frequency of use of food groups as a basis for alternative methods of data collection (Pennsylvania State University)	13,063	
	TOTAL	4,164,644

B. Nutrient Data Research

I. Intramural		1,150,000
II. Extramural		216,006
1. Statistical considerations in preparation and use of food composition tables and data bases (International Network of Food Data Systems)	26,010	
2. Nutrient content of selected miscallenous foods purchased in the U.S. (Shankman Laboratories)	28,800	
3. Proximate composition and yield of fried foods (University of Idaho)	76,891	
4. Nutrient composition of frozen prepared foods (Shankman Laboratories)	40,788	
5. Determining the nutrient content of 50 selected cereal products and 50 selected baked products (University of Georgia)	10,117	
6. Determination of nutrients in foods (ARS, reimbursable agreement)	23,400	
7. Tenth National Nutrient Databank Conference (Cooperative Extension, Univ. of California)	10,000	
	TOTAL	1,366,006

FY 1985 (continued)

C. Food Supply	
I. Intramural	105,000 1/
D. Nutrition Knowledge/Attitudes	
I. Intramural	50,000
TOTAL	5,685,650

1/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1986

A. Food Consumption Research

I.	Intramural		$ 1,600,000
II.	Extramural		7,299,846
1.	Nationwide Food Consumption Survey (data collection) (National Analysts)	$6,154,150	
2.	CSFII Nonresponse Followup (data collection) (National Analysts)	51,669	
3.	Microcomputer pretest for the Nationwide Food Consumption Survey (Creative Associates, Inc.)	37,642	
4.	Development and validation of a food frequency questionnaire (University of Michigan)	9,999	
5.	A study on dietary status and eating patterns (University of North Carolina)	120,581	
6.	A study of health-related factors affecting dietary status (University of Arizona)	104,836	
7.	A study of methodological issues in food consumption surveys (University of Arizona)	94,421	
8.	A study to analyze methodological factors affecting the measurement of dietary status (Iowa State University)	146,971	
9.	A study of changing household organization and structure of demand for food in the United States (Mississippi State University)	100,308	
10.	A study on the nutritional quality of diets of population groups in the USDA CSFII-85 (Utah State University)	101,441	
11.	A study of determinants of food group consumption patterns (University of North Carolina)	141,227	
12.	A study on the relationship of food groups and dietary intake (Cornell University)	96,601	
13.	Improved analysis procedures; and assessment of the National Nutrition Monitoring System (University of Maryland)	140,000	
		TOTAL	8,899,846

FY 1986 (continued)

B. Nutrient Data Research		
I. Intramural		1,150,000
II. Extramural		528,073
1. Eleventh National Nutrient Databank Conference (University of Georgia)	10,000	
2. Nutrient analyses of mixed dishes and ingredients (Hazleton Laboratories America, Inc.)	89,174	
3. Analysis of selenium in foods (Hazleton Laboratories America, Inc.)	57,700	
4. Nutrient analysis of selected foods (University of Georgia)	64,496	
5. Analyses of dietary fiber in foods (Hazleton Laboratories America, Inc.)	75,730	
6. Nutrient analysis of recipe-prepared foods (University of Idaho)	90,973	
7. Compilation of nutrient data in food (University of Maryland)	140,000	
	TOTAL	1,678,073
C. Food Supply		
I. Intramural		110,000 1/
D. Nutrition Knowledge/Attitudes		
I. Intramural		50,000
	TOTAL	10,737,919

1/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1987

A. Food Consumption Research

I.	Intramural		$ 1,600,000
II.	Extramural		1,027,289
1.	An analysis of variations in food consumption across household types and over time (Cornell University)	$196,321	
2.	Bridging study: NFCS 1977-78/CSFII/NFCS 1987 (National Analysts)	276,417	
3.	An analysis of the importance of socioeconomic, demographic, and personal and health-related factors and food product attributes on U.S. nutrient intakes and implications for the dietary status of the household (Washington State University)	153,308	
4.	An analysis of the effect of economic, demographic, and food choice variables on household nutritional adequacy in the United States (Regents of the University of California)	181,243	
5.	Task performance in support of Human Nutrition Information Service (University of Maryland)	220,000	
		TOTAL	2,627,289

B. Nutrient Data Research

I.	Intramural		1,200,000
II.	Extramural		394,347
1.	Analysis of selenium in foods (Hazleton Labs)	1,720	
2.	Additional analyses of selenium in foods (University of Missouri)	47,593	
3.	Determination of gross energy of selected foods (Webb Foodlab, Inc.)	49,448	
4.	Nutrient analyses of specialty fruits marketed in the United States (Univ.of Georgia Res.Found.)	60,174	
5.	Variability in sugar content of foods (University of Georgia)	40,278	

FY 1987 (continued)

6.	Nutrient analysis of trace minerals (Woodson-Tenent Laboratories, Inc.)	25,134	
7.	Support of 12th National Nutrient Databank Conference (University of Texas)	10,000	
8.	Task performance in support of Human Nutrition Information Service (University of Maryland)	160,000	
		TOTAL	1,594,347
C.	Food Supply		
I.	Intramural		115,000 1/
D.	Nutrition Knowledge/Attitudes		
I.	Intramural		50,000
		TOTAL	4,138,636

1/ Excludes NASS and ERS costs for collecting and tabulating food supply data.

FY 1988

A.	Food Consumption Research	
	I. Intramural	$ 1,600,000
	II. Extramural	2,565,000
	TOTAL	4,165,000
B.	Nutrient Data Research	
	I. Intramural	1,300,000
	II. Extramural	310,000
	TOTAL	1,610,000
C.	Food Supply	
	I. Intramural	120,000
D.	Nutrition Knowledge/Attitudes	
	I. Intramural	50,000
	II. Extramural	150,000
	TOTAL	200,000
	TOTAL	6,095,000

STATEMENT

BY

J. MICHAEL McGINNIS, M.D.

Mr. Chairman, I am Dr. J. Michael McGinnis, Deputy Assistant Secretary for Health for Disease Prevention and Health Promotion with the Public Health Service of the U.S. Department of Health and Human Services, and Chairman of the Department's Nutrition Policy Board. I appreciate this opportunity to discuss with you progress we are making in monitoring the nutritional status of the United States population. My testimony will provide a brief overview of the contributions the Department of Health and Human Services (DHHS) makes to the National Nutrition Monitoring System (NNMS), including important data resulting from these programs. I will also discuss our plans for the upcoming National Health and Nutrition Examination Survey (NHANES), the Department's major nutrition survey, and discuss several issues related to the coordination of nutrition monitoring programs.

Nutrition Monitoring in DHHS

The National Nutrition Monitoring System (NNMS) is a complex assortment of interconnected activities that provide regular information about the contribution of diet and nutritional status to the health of the American people, and about factors affecting diet and nutritional status. DHHS and the Department of Agriculture (USDA) have primary responsibility for the NNMS programs. A detailed description of the programs included in the NNMS is included in the "Operational Plan for the National Nutrition Monitoring System," updated by USDA and DHHS in August 1987, which I would like to provide for the record. I will briefly summarize several DHHS programs that contribute to this system.

Centers for Disease Control (CDC): Within CDC, two centers have major nutrition responsibilities. The first is the National Center for Health Statistics (NCHS), which became a part of CDC during the last year. As the Federal government's principal health statistics agency, NCHS conducts a broad program of data collection and interpretation on all aspects of health, including nutrition. A number of NCHS data systems provide nutrition-related information from personal interviews, examinations, epidemiologic followup, and review of health care provider and vital records systems. The major nutrition program of NCHS is the National Health and Nutrition Examination Survey, which I will describe in some detail later.

The second CDC component, the Center for Health Promotion and Education (CHPE), maintains a number of nutrition-related surveillance systems that provide data on populations of particular concern. Under the Coordinated State Surveillance System, the nutritional status of high-risk pediatric and pregnant populations is monitored through the collection of data readily available from service delivery programs operated by participating State and local health jurisdictions and from the Federal Health Resources and Services Administration. This system provides information about the prevalence of overweight, underweight, retarded linear growth, and anemia among high-risk children. Among women, surveillance data are collected in regard to anemia, abnormal weight changes during pregnancy, birth weight of the child, and whether breast or bottle feeding is used and for how long. As part of a departmental initiative, the collection of surveillance data on nutritional and other risk factors in pregnancy is now being extended in collaboration with State health departments. Another initiative is testing the feasibility of collecting information on cases of severe pediatric undernutrition in collaboration with four State health departments.

Since 1984, CHPE has conducted a State-based Behavioral Risk Factor Surveillance System that routinely collects data on the prevalence of behavioral risk factors associated with premature death and disability. These include nutrition-related risk factors such as obesity, hypertension, excessive alcohol consumption, and lack of physical exercise. More than 35 States participate in the Pediatric Surveillance System and the Behavioral Risk Factor Surveillance System, while 14 participate in the Pregnancy Surveillance System. The information obtained from the States is provided back to them for their use in program planning and monitoring of trends.

Food and Drug Administration: The Food and Drug Administration (FDA) maintains several programs that provide information on the safety of the food supply, surveillance for adverse reactions to foods, and public attitudes, knowledge, and practices about food and nutrition. The Total Diet Study monitors on an annual basis the levels in representative diets of various food contaminants and nutrients not covered by other surveys (such as pesticides, heavy metals, and essential trace elements). Through the Diet and Health Survey, FDA periodically surveys the public's attitudes and knowledge of nutrition-related health problems such as hypertension, hypercholesterolemia, coronary heart disease, and cancer. FDA uses the information gained through these surveys to monitor trends in exposure to both beneficial and harmful substances in food, and to evaluate the need for revisions in food fortification and labeling policy.

National Institutes of Health: NIH is the major agency in the Federal government that supports nutrition research and training as it relates to health maintenance, human development, disease prevention, and disease treatment--$213 million in Fiscal Year 1986. The NIH and its Clinical Nutrition Research Units and Centers support and conduct research on nutritional status assessment and epidemiological nutrition research. Fiscal Year 1986 expenditures for these two categories were $28 million each. NIH studies to develop improved methods of measuring dietary intake, biochemical and clinical indices of nutritional status, and other monitoring-related research are integrated into existing nutrition monitoring programs such as NHANES. In addition to this methodological support, the NIH continues to provide yearly funding for NHANES, for example it will provide an estimated 2.4 million dollars in Fiscal Year 1988. The NIH also performs follow-up studies using NHANES data in order to test hypotheses about the relationship of dietary practices to the incidence of diseases and conditions such as cancer, cardiovascular disease, obesity, and osteoporosis, as well as to study the effect of diet on overall health and longevity. Results of surveys conducted by the NIH on dietary and health practices and attitudes have contributed to the development of nutrition education materials and information dissemination to health professionals and the public. The nutrition research efforts and education programs of the NIH are coordinated through the NIH Nutrition Coordinating Committee.

National Health and Nutrition Examination Survey (NHANES III)

The National Health and Nutrition Examination Survey (NHANES), together with USDA's Nationwide Food Consumption Survey, forms the cornerstone of the National Nutrition Monitoring System, as well as serving as the vehicle for other epidemiologic studies. NHANES III, to begin later this year, is the latest of a series of studies involving health and dietary interviews, physical examinations, and diagnostic and biochemical testing of a representative sample of Americans.

NHANES III has two primary nutrition objectives: First, to provide data for the monitoring of nutritional status, including tracking of nutrition-related risk factors and estimation of the prevalence of compromised nutritional status; and second, to provide information useful for studying the relationship between diet, nutritional status, and health.

NHANES III is a truly collaborative study conducted by NCHS with the programmatic and resource support of more than a dozen agencies, centers, and institutes throughout the Federal government. The content of the nutritional component of NHANES III has been planned with recommendations and assistance from a variety of sources. An expert working group sponsored by FDA reviewed data from past NHANES and provided recommendations regarding biochemical and hematologic determinations. A dietary methodology workshop was sponsored by NCHS in March 1986 and provided recommendations for dietary interview methods. In addition to convening special working groups, recommendations and suggestions of topics for inclusion were solicited throughout the Federal government and from nutrition researchers and other data users outside of the government.

The nutrition component of NHANES III includes body measurements, blood tests for selected indicators of nutritional status, and food frequency and 24-hour dietary recall methodologies that will be used to determine the nutritional status and dietary intake of the population. Interviews also include questions about factors that may influence nutritional status such as meal program participation, the nature of home water supply, history of anemia, infant feeding practices, use of vitamin/mineral supplements, and eating habits and lifestyles.

NHANES III represents an improvement over earlier surveys. New features include a longitudinal component that will allow followup and possible reexamination; automated data collection; and long-term biological specimen banking. These features will increase the scientific yield from the survey and will allow for greater timeliness and responsiveness. In addition, the age range of the NHANES sample will be extended to include persons ages two months and above. Special sampling of infants, children, the elderly, and minority groups such as blacks and Hispanics will also permit estimates of the health and nutritional status of these groups.

NCHS has just completed a full-scale pretest of NHANES III, and is preparing for the onset of full field operations in September. As final preparations are made, NCHS will be able to provide more detail on the projected release date of findings from the survey.

Uses of Nutrition Monitoring Data

We have found that the information generated by the Department's surveillance and monitoring systems is invaluable. The descriptive information helps in program planning at both the State and Federal levels by contributing to our understanding of the nature and magnitude of nutrition-related health problems in the population. Surveys such as NHANES provide national reference data that can be used as benchmarks for smaller studies and in clinical practice. One of the best examples of this application is provided by the NCHS/CDC Growth Charts that are used to monitor the growth of children both here and abroad. The data from this survey are also vital to assessing the need for changes in fortification policies and other regulatory activities which assure the nutritional quality of the food supply. Finally, the surveys conducted by the monitoring system can be used in epidemiologic research to study the relationships among diet, nutritional status, and disease. Some recent examples of information from the Department's nutrition monitoring efforts include:

- Serum cholesterol levels have declined significantly among adult men and women, but mean levels still exceed the desirable level of less than 200 mg/dl and about 57 percent of adults ages 20-74 years old have levels higher than 200 mg/dl. Since many people can lower serum cholesterol with dietary change, the prevalence of high serum cholesterol in the U.S. population is an important nutrition-related problem nationally. We know that the levels of HDL-cholesterol are higher among women than men, and higher among black men and women than among whites. These findings from the National Health and Nutrition Examination Surveys are being used to help target the National Cholesterol Education Program, which is lead by the National Heart, Lung, and Blood Institute of NIH.

- Obesity continues to be a prominent nutrition-related problem among adults. NHANES data continue to show that approximately 25 percent of Americans are overweight. Among women, rates of obesity are much higher among those who are black than those who are white. The Behavioral Risk Factor Surveillance System reported that the highest prevalence of overweight among adults was observed in West Virginia, and the lowest in Utah and Hawaii.

- The vitamin A status for the vast majority of the population is adequate; however, for Hispanics inadequate intakes may exist. Since the early 1970's, surveys have shown that Hispanic children have a higher prevalence of low serum vitamin A values than non-Hispanic white children. The Hispanic Health and Nutrition Examination Survey has found that the higher prevalence among Mexican American children is probably attributable more to poverty and related environmental factors than to ethnicity.

- Iron status for most of the population is satisfactory, and addition of more iron to the food supply is not warranted. However, some segments of the population continue to have impaired iron status which needs treatment, for example through dietary changes or use of supplements. Impaired iron status occurs more frequently among women of childbearing age and young children, with the highest prevalence occurring among minority groups and those living below the poverty level. In the Hispanic Health and Nutrition Examination Survey, impaired iron status was observed in 9.9 percent of Mexican-American women, approximately double the rate observed in non-Hispanic white women who were 20-44 years of age.

- The prevalence of anemia among children from lower-income families residing in six states participating in the Pediatric Nutrition Surveillance System declined by 60 percent between 1975 and 1985, but it is still higher than that among children from middle-income families. Iron nutriture is usually related to socioeconomic status; however, because of the magnitude and consistency of the decline, and relatively constant family income in the sample states, the decrease in anemia is unlikely to be related to changes in the overall socioeconomic background of children included in the surveillance system. Rather, changes in the prevalence of anemia appear to be due to the beneficial effects of nutrition assistance and public health programs targeted to the low-income population, and to more widespread fortification of infant foods with iron.

- According to the NCHS National Health Interview Survey, 36 percent of children under 18 years of age used vitamin or mineral supplements in the two weeks prior to their interview. This level of use is in contradiction to recent recommendations from the American Academy of Pediatrics which stated that supplements usually were not indicated for healthy children over 6 months of age. Analysis of data from the second National Health and Nutrition Examination Survey found that iron nutritional status among children was not associated with supplement use, suggesting that most children already were receiving sufficient amounts of iron in their diets.

- In the 1970's, the Total Diet Study indicated that intake levels of iodine may have ranged up to 10 times the Recommended Dietary Allowances, raising concern about the potential for adverse health effects. This information triggered close attention to identification and control of sources of iodine added to the food supply, and there has been a decrease in the very high levels of iodine in food.

Management and Coordination of Nutrition Monitoring Activities

Nutrition monitoring programs in DHHS, though decentralized, are linked and coordinated through interagency mechanisms, such as the DHHS Nutrition Policy Board. Participation of each of the PHS agencies in the planning for NHANES III is one example of the depth of interagency collaboration within DHHS. Over the last several years, in response to the interest of both the Congress and our own nutrition researchers, we have made concerted efforts to broaden collaboration and coordination between DHHS and USDA--particularly between NCHS and USDA's Human Nutrition Information Service (HNIS), managers of the two primary nutrition survey programs. NCHS and HNIS interaction now includes: quarterly coordinating committee meetings to address technical issues; collaboration on the production of Nutrition Monitoring in the United States, the report to Congress from the Joint Nutrition Monitoring Evaluation Committee; agreement to base the surveys of both agencies on the USDA Nutrient Data Bank; and dealing with a wide range of comparability issues between their respective surveys.

On a broader scale, DHHS and USDA are jointly sponsoring a contract to the Life Sciences Research Office of the Federation of American Societies for Experimental Biology for a scientific evaluation of nutrition monitoring data that will lead to the second report to Congress on nutrition monitoring. Management of this project is under the direction of a joint steering committee with representatives of all major nutrition monitoring data generators and users in both departments. NCHS is the Executive Secretariat for the project.

Finally, to further facilitate coordination among the two core surveys and other Federal surveys that contain nutrition monitoring components, an

Administration-wide interagency committee on nutrition monitoring is being formed and should be in place by early summer. The committee will be co-chaired by the Assistant Secretary for Health, DHHS, and the Assistant Secretary for Food and Consumer Services, USDA, and will include representatives from Federal agencies conducting nutrition monitoring activities as well as those agencies using nutrition monitoring data. It will interact closely with the existing Interagency Committee on Human Nutrition Research.

In short, we have devoted a great deal of effort to establishing mechanisms to improve coordination of the National Nutrition Monitoring System, and have now moved to address substantive issues. In many respects, we have been successful. Regular interchange between staff and managers of DHHS and USDA nutrition monitoring programs has led to better joint planning efforts, and surveys have been made more comparable. Many of the steps proposed in S. 1081 and other legislation have been taken administratively, and other improvements will be pursued in the future. Our experience has also been instructive for our future steps and use in assessing legislation such as S. 1081. We have learned that formal coordinating mechanisms are not a substitute for direct interchange at the researcher-scientist level, and that it is the initiative and interest of professionals in programs of each of the Departments that most often lead to real progress. We have also learned, as the National Academy of Sciences concluded in 1984, that there are real and legitimate differences between the mission of USDA and DHHS monitoring programs. These differences often influence the degree of comparability and uniformity that can be achieved.

Coordination of Dietary Guidance Information

DHHS is committed to providing scientifically accurate, consistent dietary guidance to the population using the framework of the Dietary Guidelines for Americans, and was, in fact, the major drafter of the first Dietary Guidelines for Americans issued in 1980, and a partner in the preparation of the 1985 revision. As part of its nutrition-related activities, DHHS coordinates dietary information within the Department and between the Department and other Federal agencies through a variety of formal and informal channels. The principal mechanisms for formal coordination include:

The Subcommittee on Dietary Guidance of the DHHS Nutrition Policy Board. The mandate of this subcommittee is to coordinate DHHS agency activities that offer dietary guidance information targeted to the healthy American population, to ensure the consistency of such activities with the principles established in the Dietary Guidelines for Americans, to encourage development of coordinated DHHS positions on dietary guidance, and to increase the levels of cooperation and coordination between DHHS and USDA in order to facilitate consistency in dietary guidance from Federal sources. Membership of the subcommittee includes representatives from DHHS agencies that produce dietary guidance information as well as a liaison representative from USDA.

USDA Dietary Guidance Working Group. A DHHS liaison representative attends meetings of this committee which is responsible for reviewing USDA dietary guidance publications.

USDA/DHHS Nutrition Education Committee for Maternal and Child Nutrition Publications. This committee functions to promote joint efforts between USDA and DHHS on educational materials related to maternal and child nutrition in order to assure consistency of content, to avoid duplication, and to make more effective use of resources. In 1987, this committee developed materials on nutrition in adolescent pregnancy, cross-cultural nutrition counseling, and nutrition resources for American Indians and Alaskan Natives.

In addition to these mechanisms, each DHHS agency has developed its own internal review procedures for dietary guidance publications. These procedures are coordinated through the Nutrition Policy Board Subcommittee on Dietary Guidance.

Comments on S. 1081

I would now like to address S. 1081. DHHS is firmly committed to the objective of a coordinated and effective National Nutrition Monitoring System; however, it is our continuing view that this bill would not contribute to reaching this objective and might even impede progress, and, therefore, the Administration opposes enactment of S. 1081. As in the previous Congress, our concerns regarding Titles I and II of the bill continue to center on three areas:

- Over the past three years we devoted considerable effort to strengthening coordinative aspects of our nutrition monitoring activities and in doing so have taken administratively many of the steps proposed in S. 1081. We believe that the remaining coordinative challenges can be better addressed through these mechanisms in which we have already invested considerable effort.

- The time and resources required to implement further new administrative structures would have to be drawn from existing program funds and staff and would impede our current nutrition monitoring data collection and analysis activities.

- Implementation of a separate line item for nutrition monitoring activities remains problematic, since much of the data from the NNMS is obtained from surveys that address other health issues as well. It is inappropriate to split the funding for a single survey between two line items, or to overstate the cost of nutrition monitoring by including total survey costs under a nutrition line item.

With regard to Title III, we believe that the mechanisms currently operating within DHHS and between DHHS and USDA productively meet the need of providing consistent dietary guidance to the public.

We are proud of our accomplishments in promoting excellence in nutrition monitoring, nutritional epidemiology, dietary guidance, and the management and coordination of the National Nutrition Monitoring System, and we look forward to pursuing these efforts even more intensively in the future. Many provisions in proposed legislation such as S. 1081 are now being done within existing authorities. We remain concerned that legislation mandating specific administrative structure and bureaucratic mechanisms is unnecessary and may be counterproductive.

Mr. Chairman, I appreciate your interest and that of your Committee in this area, and I thank you for the opportunity to speak with you today. My colleagues and I would be happy to respond to your questions.

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

Memorandum

Date APR 12 1988

From Nutrition Advisor, ODPHP

Subject Nutrition Monitoring Expenditures

To Judy Lewis, ASH/L

Attached as requested are estimates for nutrition monitoring expenditures for FY 80-88 from CDC/NCHS (p.1 of Attachment), FDA (pp. 2-5), and NIH (p. 7). I have also enclosed several summary tables (pp. 6 and 8, drawn from individual agency expenditures. Please note that updated figures from CDC's Center for Health Promotion and Education are still coming. I understand that have done a more extensive breakdown than previously, and still need to clear it.

We have updated the material provided to CRS in July 1986, which in turn is found in the CRS Report "A National Nutrition Monitoring System: Background and Bill Review," February 23, 1988, p. 46.

As always the figures make a number of assumptions since it is difficult in many cases to tease out just what constitutes a nutrition monitoring component as distinguished from more general nutrition research components and from other health related components.

I assume that copies of the expenditures are to go to Senate Governmental Affairs staff (E. Chafness) and Senate Agriculture staff (J. Breslin). Please let me know if I can be of further assistance.

Linda Meyers

Linda D. Meyers, Ph.D.

Centers for Disease Control
National Center for Health Statistics
HANES HISTORY TABLE
Expenditures+

Fiscal Year	NHANES I & II*	H HANES**	NHANES III	TOTAL
1980	Cleanup/Analysis $ 3,272,800	$ 0	$ 0	$ 3,272,800
1981	416,000	Planning 4,502,900	0	4,919,500
1982	448,150	Data Collection 7,764,900	0	8,213,050
1983	448,700	6,686,600	0	7,135,300
1984	515,600	7,366,600	0	7,882,200
1985	489,300	Data Collection 1,124,600 Cleanup/Analysis 2,572,400	Planning 1,968,000	6,154,300
1986	5,400	2,288,900	4,545,000	6,839,300
1987	0	1,849,000	8,129,000	9,978,000
1988	0	1,526,000	9,033,000	10,559,000
1989	0	1,088,000	Data Collection 10,697,000	11,785,000
TOTAL	5,596,500	36,769,900	34,372,000	76,738,450

+This table is an update of the PHS submission to CRS in July 1986 and to Proter, 1988, p. 46. Expenditures are for total survey, including nutrition component. The total expenditures include staff, contractual arrangement and NCHS overhead. Accounting information is not available for precisely determining the amount of funding for the nutrition component. However, the best estimate at this time is that expenditures related to nutrition monitoring are about 40 percent of total expenditures.

*NHANES is the National Health and Nutrition Examination Survey.

**HHANES is the Hispanic Health and Nutrition Examination Survey.

FDA - Nutrition Monitoring Components: Expenditures

April 12, 1988

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
Selected Minerals in Foods (Nutrition portion of Total Diet Study)				
FY80	84,885	42,880	---	127,765
FY81	75,705	52,930	---	128,635
FY82	92,100[a]	104,300	---	196,400[a]
FY83	92,000[b]	40,296[b]	---	132,296[a, b]
FY84	207,650	88,312	---	295,962
FY85	169,150	47,810	---	216,960
FY86	149,000	47,040	---	196,040
FY87	156,500	72,000[c]	---	228,500[c]
FY88	210,000[c]	72,000[c]	---	282,000[c]
FY89	210,000[c]	d	---	d
Key Human/Pediatric Nutrition Problem Areas				
FY80	---	0	271,276	271,276
FY81	---	670	0	670
FY82	---	0	105,861	105,861
FY83	---	8,760[b]	360,537	369,297[b]
FY84	---	57,380	495,174	552,554
FY85	---	56,840	588,635	645,475
FY86	---	35,920	360,628	396,548
FY87	---	54,000[c]	386,568	440,568[c]
	(Program reorganized for FY88)			
Food Consumption, Diet and Health				
FY80	---	96,640	1,625,895	1,722,535
FY81	---	145,390	0	145,390
FY82	---	242,900	73,197	316,097
FY83	---	440,628[b]	0	440,628[b]
FY84	---	491,188	70,000	561,188
FY85	---	653,530	134,400	787,930
FY86	---	638,080	80,000	718,080
FY87	---	1,044,000[c]	460,000	1,504,000[c]
	(Program reorganized for FY88)			
Applied Clinical Nutrition				
FY88	---	312,000[c]	400,000[c]	712,000[c]
FY89	---	d	d	d
Nutrition Monitoring				
FY88	---	588,000[c]	---	588,000[c]
FY89	---	d	d	d
Diet and Health Relationships				
FY88	---	588,000[c]	175,000[c]	763,000[c]
FY89	---	d	d	d

2

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
Food Labeling and Package Survey (FLAPS)				
FY80	---	256,000	89,788	345,788
FY81	---	62,980	0	62,980
FY82	---	280,000	115,508	395,508
FY83	---	162,936[b]	0	162,936[b]
FY84	---	258,300	55,765	314,065
FY85	---	274,240	94,921	369,161
FY86	---	509,920	44,596	554,516
FY87	---	360,000[c]	167,128	527,128[c]
FY88	---	810,000[c]	53,000[c]	863,000[c]
FY89	---	d	d	d
FDA/NHLBI Diet - Heart Survey				
	(Survey initiated FY84)			
FY84	---	0	75,000	75,000
FY85	---	26,820	91,402	118,222
	(Project completed)			
Multipurpose Survey and Quick Turnaround Research Service				
FY80	---	73,600	92,416	166,016
FY81	---	19,430	0	19,430
FY82	---	0	108,086	108,086
FY83	---	28,908[b]	0	28,908[b]
FY84	---	0	0	0
FY85	---	0	175,402	175,402
FY86	---	26,320	0	26,320
FY87	---	60,000[c]	2,188	62,188[c]
FY88	---	120,000[c]	5,000[c]	125,000[c]
FY89	---	d	d	d
Infant Feeding Practices				
FY85	---	20,120	133,479	153,599
FY86	---	15,040	185,511	200,551
FY87	---	180,000[c]	---	180,000[c]
FY88	---	180,000[c]	---	180,000[c]
FY89	---	d	d	d
Dietary Supplement Survey				
FY80	---	7,680	---	7,680
FY81	---	6,700	---	6,700
FY82	---	2,800	---	2,800
FY83	---	2,628[b]	---	2,628[b]

(After FY83, work performed as part of Multipurpose Survey; contract funds specific for this project expended prior to FY80)

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
Consumer Package Information Research				
FY80	---	9,600	87,950	97,550
FY81	---	4,020	87,338	91,358
FY82	---	172,200	---	172,200
FY83	---	26,280[b]	---	26,280[b]
FY84	---	1,833	---	1,833
(Project discontinued as such after FY84)				
Consumer Needs Research				
FY80	---	2,560	---	2,560
FY81	---	32,830	---	32,830
FY82	---	68,600	---	68,600
FY83	---	99,864[b]	---	99,864[b]
(Project discontinued as such after FY83)				
Study of Weightloss Dieting				
FY85	---	8,660	90,119	98,779
FY86	---	36,680	---	36,680
FY87	---	120,000[c]	---	120,000[c]
FY88	---	48,000[c]	---	48,000[c]
FY89	---	d	---	d
Miscellaneous other consumer surveys work and projects				
FY80	---	0	174,567	174,567
FY81	---	0	30,000	30,000
FY82	---	0	50,000	50,000
FY83	---	19,272[b]	9,495	28,767[b]
FY84	---	22,660	31,434	54,094
FY85	---	0	84,000	84,000
FY86	---	0	0	0
FY87	---	0[c]	0[c]	0[c]
FY88	---	0[c]	0[c]	0[c]
FY89	---	d	d	d
Nutrient Analysis Methods - Lipids, Vitamins and Minerals				
FY80	---	287,360	---	287,360
FY81	---	417,410	---	417,410
FY82	---	273,000	---	273,000
FY83	---	409,968[b]	---	409,968[b]
FY84	---	464,360	---	464,360
FY85	---	435,280	---	435,280
FY86	---	355,120	---	355,120
FY87	---	558,000[c]	---	558,000[c]
FY88	---	654,000[c]	---	654,000[c]
FY89	---	d	d	d

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
Compliance Nutrient Analysis				
FY80	584,100	720,000	32,280	1,337,380
FY81	407,000	570,170	25,200	1,002,370
FY82	221,600	651,000	---	872,600
FY83	269,450	698,172[b]	---	967,622[b]
FY84	290,300	356,592	---	646,892
FY85	328,000	295,670	---	623,670
FY86	332,500	285,040	---	617,540
FY87	270,000	486,000[c]	---	756,000[c]
FY88	327,500[c]	318,000[c]	---	645,500[c]
FY89	310,000[c]	d	d	d
Nutrient Surveillance				
FY80	0	16,640	---	16,640
FY81	132,050	57,620	---	189,670
FY82	358,350	41,300	---	399,650
FY83	240,150	29,784[b]	---	269,934[b]
FY84	200,500	93,404	---	293,904
FY85	511,700	37,620	---	549,320
FY86	366,500	111,840	---	578,340
FY87	388,000	120,000[c]	---	508,000[c]
FY88	317,500[c]	0[c]	---	317,500[c]
FY89	350,000[c]	d	d	d

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[a] Estimates based on the Technical Plan; the Nutrition part was not separable from the data for the rest of the study for these years.

[b] Data for last two months of the year not retrievable; figures projected from 10 months of data.

[c] Planned Expenditures. FY87 actual expenditures in the process of being compiled.

[d] Planning process in progress; to be completed by August.

(6) 4/14

FDA Nutrition Monitoring Components; Sums of Annual Totals For Each Activity, FY 1980 -FY1989

	1980	1981	1982	1983[b]	1984	1985	1986	1987[c]	1988	19
Total Diet Study-Nutr.	$127,765	$128,635	$196,400[a]	$132,296[a]	$295,962	$216,960	$196,040	$228,500	$282,000	avail. A
Key Human/Pediatric	$271,276	$670	$105,861	$369,297	$552,554	$645,475	$396,540	$440,568		
Fd Cons/Diet & Health	$1,722,535	$145,390	$316,097	$440,620	$561,100	$787,930	$710,000	$1,504,000		
Applied Clinical Nutr.									$712,000	avail. A
Nutrition Monitoring									$588,002	avail. A
FLAPS	$345,700	$62,900	$395,500	$162,936	$314,065	$369,161	$554,516	$527,120	$863.000	avail. A
Diet and Health Relnshps									$763,000	avail. A
FDA/NHLBI Diet-Heart					$75,000	$110,222 Completed				
Multipurpose survey	$166,016	$19,430	$100,006	$20,900	$0	$175,402	$26,320	$62,100	$125,000	avail. A
Infant Feeding Pract.						$153,595	$200,551	$100,000	$100,000	avail. A
Dietary Suppl.	$7,600	$6,700	$2,000	$2,620						
Consumer Package Info.	$97,550	$91,350	$172,200	$26,280	$1,833					
Consumer Needs Res.	$2,560	$32,030	$60,600	$99,064						
Study/Weightloss Dieting						$98,779	$36,600	$120,000	$40,000	avail. A
Misc.	$174,567	$30,000	$50,000	$26,767	$54,094	$94,000	$0	$0	$0	avail. A
Nutrient Analysis	$287,360	$417,410	$273,000	$409,960	$464,350	$435,200	$355,120	$558,000	$654,000	avail. A
Compliance Nutr. Analysis	$1,337,300	$1,002,370	$872,600	$967,622	$646,092	$623,670	$617,540	$756,000	$645,500	avail. A
Nutrient Surveillance	$16,640	$189,670	$395,650	$269,934	$293,904	$549,320	$570,340	$500,000	$317,500	avail. A
TOTAL	$4,557,117	$2,127,443	$2,960,002	$2,939,120	$3,259,052	$4,257,794	$3,679,735	$4,004,304	$5,170,000	

a/ Estimates based on the Technical Plan; the Nutrition Part was not separable from the data for the rest of the study for these years.

b/ Data for last two months of the year not retrievable; figures projected from 10 months of data.

c/ Planned Expenditures. FY87 actual expenditures in the process of being compiled.

Summary Table
Compiled by ODPHP 4/12/88
based on FDA data

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THE NATIONAL INSTITUTES OF HEALTH BIOMEDICAL AND BEHAVIORAL NUTRITION RESEARCH AND TRAINING AND RESEARCH ON NUTRITIONAL STATUS

The following table provides expenditures for FY 1980-1986 and estimated projections for FY 1987-1989 for the NIH Program in Biomedical and Behavioral Nutrition Research and Training. Of the projects included in the program, expenditures for those projects that involve research on nutritional status are presented in the second column. The third column is the percentage of expenditures for nutritional status research as a percentage of total expenditures for biomedical and behavioral nutrition research and training.

Anticipated expenditures for sub-areas in nutrition research are not available for FY 1987-1989. However, if one assumes that the proportion of nutrition research funds allocated to nutritional status research remains constant for FY 1986, 1987, 1988, and 1989, then a figure of 13% might be used.

Expenditures by the National Institutes of Health for Biomedical and Behavioral Nutrition Research and Training and for Projects in Research on Nutritional Status*
FY 1980 - 1986
(dollars in thosands)

Year	Biomedical Nutrition Research & Training	Nutritional Status Research+	Percent of Biomedical Nutrition Research and Training
1980	139,121	31,055	22
1981	148,501	34,520	23
1982	144,323	21,607	15
1983	164,306	30,871	19
1984	192,918	35,116	18
1985	207,316	29,769	14
1986	212,978	27,743	13
1987	260,025*	N/A	13**
1988	272,540*	N/A	13**
1989	293,191*	N/A	13**

* Estimates Provided by the NIH Division of Financial Management, 3/88.

** Projected percentage estimates based on FY 1986 activity level.

+ Includes research on methods for the determination of nutritional status and surveillance: dietary history and food consumption, biochemical determinants, anthropometry, and clinical examination.

NCC 4/11/88

4/12/88

NUTRITION MONITORING EXPENDITURES, TOTALS FOR FY80-88, BY AGENCY

Fiscal Year	CHPE CDC	NCHS CDC	FDA	NIH	TOTAL
1980	1.440	1.309	4.557	31.055	38.361
1981	1.440	1.968	2.127	34.520	40.055
1982	1.440	3.285	2.961	21.607	29.293
1983	1.440	2.854	2.939	30.871	38.104
1984	1.440	3.153	3.260	35.116	42.969
1985	1.440	2.462	4.258	29.769	37.929
1986	1.440	2.736	3.680	27.743	35.599
1987	1.440	3.991	4.884	33.803	44.118
1988	2.440	4.224	5.178	35.430	47.272
TOTAL	13.960	25.982	33.844	279.914	353.700
AVERAGE	1.551	2.219	3.760	31.102	39.300

NOTE:

A/ THESE FIGURES ASSUME THAT 40% OF TOTAL HANES EXPENDITURES ARE NUTRITION.

B/ CDC, CHPE FIGURE FOR 1988 IS A ROUGH ESTIMATE ONLY;

- -

IF ONE TOTAL NHANES FIGURES ARE USED IN THE CALCULATIONS, THEN THE FOLLOWING TO

Fiscal Year	CHPE CDC	NCHS CDC	FDA	NIH	TOTAL
1980	1.440	3.273	4.557	31.055	40.325
1981	1.440	4.920	2.127	34.520	43.007
1982	1.440	8.213	2.961	21.607	34.221
1983	1.440	7.135	2.939	30.871	42.385
1984	1.440	7.882	3.260	35.116	47.698
1985	1.440	6.154	4.258	29.769	41.621
1986	1.440	6.839	3.680	27.743	39.702
1987	1.440	9.978	4.884	33.803	50.105
1988	2.440	10.559	5.178	35.430	53.607
TOTAL	13.960	64.953	33.844	279.914	392.671
AVERAGE	1.551	7.217	3.760	31.102	43.630

DHHS NUTRITION MONITORING EXPENDITURES, TOTALS FOR FY80-88, BY AGENCY

A. BASED ON ASSUMPTION THAT 40% OF HANES EXPENDITURES ARE NUTRITION:

Fiscal Year	CHPE CDC	NCHS CDC	FDA	NIH	TOTAL
1980	1.440	1.309	4.557	31.055	38.361
1981	1.440	1.968	2.127	34.520	40.055
1982	1.440	3.285	2.961	21.607	29.293
1983	1.440	2.854	2.939	30.871	38.104
1984	1.440	3.153	3.260	35.116	42.969
1985	1.440	2.462	4.258	29.769	37.929
1986	1.440	2.736	3.680	27.743	35.599
1987	3.315	3.991	4.884	33.803	45.993
1988	3.315	4.224	5.178	35.430	48.147
TOTAL	16.710	25.982	33.844	279.914	356.450
AVERAGE	1.857	2.372	3.760	31.102	39.606

- -

B. BASED ON ASSUMPTION THAT ALL HANES EXPENDITURES ARE RELATED TO NUTRITION MONITORING:

Fiscal Year	CHPE CDC	NCHS CDC	FDA	NIH	TOTAL
1980	1.440	3.273	4.557	31.055	40.325
1981	1.440	4.920	2.127	34.520	43.007
1982	1.440	8.213	2.961	21.607	34.221
1983	1.440	7.135	2.939	30.871	42.385
1984	1.440	7.882	3.260	35.116	47.698
1985	1.440	6.154	4.258	29.769	41.621
1986	1.440	6.839	3.680	27.743	39.702
1987	3.315	9.978	4.884	33.803	51.980
1988	3.315	10.559	5.178	35.430	54.482
TOTAL	16.710	64.953	33.844	279.914	395.421
AVERAGE	1.857	7.217	3.760	31.102	43.936

NOTE: BECAUSE IT IS DIFFICULT TO PRECISELY SEPARATE NUTRITION MONITORING COMPONENTS FROM BROADER NUTRITION AND HEALTH RESEARCH PROJECTS AND SURVEYS, THESE FIGURES SHOULD BE CONSIDERED BEST JUDGMENT ESTIMATES.

PLEASE REFER TO THE ATTACHED DETAILED TABLES FOR EXPLANATION OF THE CATEGORIES AND THE UNDERLYING ASSUMPTIONS.

REV. 4/13/88

CDC/Center for Health Promotion
and Education (CHPE)

UPDATE ON FUNDING LEVELS#
NUTRITION MONITORING ACTIVITIES

CENTERS FOR DISEASE CONTROL

CENTER FOR HEALTH PROMOTION AND EDUCATION

Funding levels for nutrition monitoring activities conducted by the Center for Health Promotion and Education of the Centers for Disease Control for FY 1987 and FY 1988, and anticipated levels for FY 1989, are as follows:

ANNUAL FUNDING (same levels for FY 1987, 1988 and anticipated for FY 1989)

PROJECT	IN-HOUSE	EXTRAMURAL*	TOTALS
NUTRITION SURVEILLANCE (includes Pediatric and Pregnancy Nutrition Surveillance Systems)	$ 1,440,000	-	$ 1,440,000
INFANT MORTALITY INITIATIVE (nutrition-related portion of initiative includes enhancement to Pregnancy Nutrition Surveillance System)	$ 475,000	$ 400,000	$ 875,000
SEVERE PEDIATRIC UNDERNUTRITION (surveillance of severe undernutrition in children)	$ 350,000	$ 650,000	$ 1,000,000
TOTALS	$ 2,265,000	$ 1,050,000	$ 3,315,000

*Represents cooperative agreement funding

4/13/88

#Funding levels for FY 1980 - FY 1986, as provided to CRS in July 1986, and reported in Porter, 1988, were $ 1,440,000 annually for Nutrition Surveillance.

CDC/National Center for Health
Statistics (NCHS)

Centers for Disease Control
National Center for Health Statistics
HANES HISTORY TABLE
Expenditures+

Fiscal Year	NHANES I & II*	H HANES**	NHANES III	TOTAL
1980	Cleanup/Analysis $ 3,272,800	$ 0	$ 0	$ 3,272,800
1981	416,000	Planning 4,502,900	0	4,919,500
1982	448,150	Data Collection 7,764,900	0	8,213,050
1983	448,700	6,686,600	0	7,135,300
1984	515,600	7,366,600	0	7,882,200
1985	489,300	Data Collection 1,124,600 Cleanup/Analysis 2,572,400	Planning 1,968,000	6,154,300
1986	5,400	2,288,900	4,545,000	6,839,300
1987	0	1,849,000	8,129,000	9,978,000
1988	0	1,526,000	9,033,000	10,559,000
1989	0	1,088,000	Data Collection 10,697,000	11,785,000
TOTAL	5,596,500	36,769,900	34,372,000	76,738,450

+This table is an update of the PHS submission to CRS in July 1986 and to Proter, 1988, p. 46. Expenditures are for total survey, including nutrition component. The total expenditures include staff, contractual arrangement and NCHS overhead. Accounting information is not available for precisely determining the amount of funding for the nutrition component. However, the best estimate at this time is that expenditures related to nutrition monitoring are about 40 percent of total expenditures.

*NHANES is the National Health and Nutrition Examination Survey.

**HHANES is the Hispanic Health and Nutrition Examination Survey.

FDA.Summary

FDA Nutrition Monitoring Components; Sums of Annual Totals For Each Activity, FY 1980 -FY1989

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Total Diet Study-Nutr.	$127,765	$120,635	$196,400	$132,296	$295,962	$216,960	$196,040	$220,500	$282,000	avail. Aug.
Key Human/Pediatric	$271,276	$670	$105,061	$369,297	$552,534	$645,475	$396,540	$440,560		
Fd Cons/Diet & Health	$1,722,535	$145,390	$316,097	$440,620	$561,100	$787,930	$710,000	$1,504,000		
Applied Clinical Nutr.									$712,000	avail. Aug.
Nutrition Monitoring									$500,000	avail. Aug.
FLAPS	$345,700	$62,900	$395,500	$162,936	$314,065	$369,161	$554,316	$527,120	$863,000	avail. Aug.
Diet and Health Relnshps									$763,000	avail. Aug.
FDA/NHLBI Diet-Heart					$75,000	$110,222	Completed			
Multipurpose survey	$166,016	$19,430	$100,065	$20,900	$0	$175,402	$26,320	$62,100	$125,000	avail. Aug.
Infant Feeding Pract.						$153,595	$200,551	$100,000	$100,000	avail. Aug.
Dietary Suppl.	$7,600	$6,700	$2,000	$2,620						
Consumer Package Info.	$97,550	$91,350	$172,200	$26,200	$1,033					
Consumer Needs Res.	$2,560	$32,030	$60,600	$95,064						
Study/Weightloss Dieting						$90,779	$36,600	$120,000	$40,000	avail. Aug.
Misc.	$174,567	$30,000	$50,000	$20,767	$54,094	$84,000	$0	$0	$0	avail. Aug.
Nutrient Analysis	$207,360	$417,410	$273,000	$409,560	$464,360	$435,200	$355,120	$550,000	$654,000	avail. Aug.
Compliance Nutr. Analysis	$1,337,300	$1,002,370	$872,600	$967,622	$646,092	$623,670	$617,540	$756,000	$645,500	avail. Aug.
Nutrient Surveillance	$16,640	$109,670	$399,650	$269,934	$293,904	$549,320	$578,340	$500,000	$317,500	avail. Aug.
TOTAL	$4,557,117	$2,127,443	$2,960,082	$2,939,120	$3,259,852	$4,257,794	$3,679,735	$4,804,304	$5,170,000	

a/ Estimates based on the Technical Plan; the Nutrition Part was not separable from the data for the rest of the study for these years.

b/ Data for last two months of the year not retrievable; figures projected from 10 months of data.

c/ Planned Expenditures. FY87 actual expenditures in the process of being compiled.

Summary Table for FDA Annual $, compiled by ODPHP, 4/12/88

FDA.1

FDA - Nutrition Monitoring Components: Expenditures

April 12, 1988

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
Selected Minerals in Foods (Nutrition portion of Total Diet Study)				
FY80	84,885	42,880	---	127,765
FY81	75,705	52,930	---	128,635
FY82	92,100[a]	104,300	---	196,400[a]
FY83	92,000[a]	40,296[b]	---	132,296[a, b]
FY84	207,650	88,312	---	295,962
FY85	169,150	47,810	---	216,960
FY86	149,000	47,040	---	196,040
FY87	156,500	72,000[c]	---	228,500[c]
FY88	210,000[c]	72,000[c]	---	282,000[c]
FY89	210,000[c]	d	---	d
Key Human/Pediatric Nutrition Problem Areas				
FY80	---	0	271,276	271,276
FY81	---	670	0	670
FY82	---	0	105,861	105,861
FY83	---	8,760[b]	360,537	369,297[b]
FY84	---	57,380	495,174	552,554
FY85	---	56,840	588,635	645,475
FY86	---	35,920	360,628	396,548
FY87	---	54,000[c]	386,568	440,568[c]
	(Program reorganized for FY88)			
Food Consumption, Diet and Health				
FY80	---	96,640	1,625,895	1,722,535
FY81	---	145,390	0	145,390
FY82	---	242,900	73,197	316,097
FY83	---	440,628[b]	0	440,628[b]
FY84	---	491,188	70,000	561,188
FY85	---	653,530	134,400	787,930
FY86	---	638,080	80,000	718,080
FY87	---	1,044,000[c]	460,000	1,504,000[c]
	(Program reorganized for FY88)			
Applied Clinical Nutrition				
FY88	---	312,000[c]	400,000[c]	712,000[c]
FY89	---	d	d	d
Nutrition Monitoring				
FY88	---	588,000[c]	---	588,000[c]
FY89	---	d	d	d
Diet and Health Relationships				
FY88	---	588,000[c]	175,000[c]	763,000[c]
FY89	---	d	d	d

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
Food Labeling and Package Survey (FLAPS)				
FY80	---	256,000	89,788	345,788
FY81	---	62,980	0	62,980
FY82	---	280,000	115,508	395,508
FY83	---	162,936[b]	0	162,936[b]
FY84	---	258,300	55,765	314,065
FY85	---	274,240	94,921	369,161
FY86	---	509,920	44,596	554,516
FY87	---	360,000[c]	167,128	527,128[c]
FY88	---	810,000[c]	53,000[c]	863,000[c]
FY89	---	d	d	d
FDA/NHLBI Diet - Heart Survey				
	(Survey initiated FY84)			
FY84	---	0	75,000	75,000
FY85	---	26,820	91,402	118,222
	(Project completed)			
Multipurpose Survey and Quick Turnaround Research Service				
FY80	---	73,600	92,416	166,016
FY81	---	19,430	0	19,430
FY82	---	0	108,086	108,086
FY83	---	28,908[b]	0	28,908[b]
FY84	---	0	0	0
FY85	---	0	175,402	175,402
FY86	---	26,320	0	26,320
FY87	---	60,000[c]	2,188	62,188[c]
FY88	---	120,000[c]	5,000[c]	125,000[c]
FY89	---	d	d	d
Infant Feeding Practices				
FY85	---	20,120	133,479	153,599
FY86	---	15,040	185,511	200,551
FY87	---	180,000[c]	---	180,000[c]
FY88	---	180,000[c]	---	180,000[c]
FY89	---	d	d	d
Dietary Supplement Survey				
FY80	---	7,680	---	7,680
FY81	---	6,700	---	6,700
FY82	---	2,800	---	2,800
FY83	---	2,628[b]	---	2,628[b]

(After FY83, work performed as part of Multipurpose Survey; contract funds specific for this project expended prior to FY80)

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
Consumer Package Information Research				
FY80	---	9,600	87,950	97,550
FY81	---	4,020	87,338	91,358
FY82	---	172,200	---	172,200
FY83	---	26,280[b]	---	26,280[b]
FY84	---	1,833	---	1,833
(Project discontinued as such after FY84)				
Consumer Needs Research				
FY80	---	2,560	---	2,560
FY81	---	32,830	---	32,830
FY82	---	68,600	---	68,600
FY83	---	99,864[b]	---	99,864[b]
(Project discontinued as such after FY83)				
Study of Weightloss Dieting				
FY85	---	8,660	90,119	98,779
FY86	---	36,680	---	36,680
FY87	---	120,000[c]	---	120,000[c]
FY88	---	48,000[c]	---	48,000[c]
FY89	---	d	---	d
Miscellaneous other consumer surveys work and projects				
FY80	---	0	174,567	174,567
FY81	---	0	30,000	30,000
FY82	---	0	50,000	50,000
FY83	---	19,272[b]	9,495	28,767[b]
FY84	---	22,660	31,434	54,094
FY85	---	0	84,000	84,000
FY86	---	0	0	0
FY87	---	0[c]	0[c]	0[c]
FY88	---	0[c]	0[c]	0[c]
FY89	---	d	d	d
Nutrient Analysis Methods - Lipids, Vitamins and Minerals				
FY80	---	287,360	---	287,360
FY81	---	417,410	---	417,410
FY82	---	273,000	---	273,000
FY83	---	409,968[b]	---	409,968[b]
FY84	---	464,360	---	464,360
FY85	---	435,280	---	435,280
FY86	---	355,120	---	355,120
FY87	---	558,000[c]	---	558,000[c]
FY88	---	654,000[c]	---	654,000[c]
FY89	---	d	d	d

FDA.4

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
Compliance Nutrient Analysis				
FY80	584,100	720,000	32,280	1,337,380
FY81	407,000	570,170	25,200	1,002,370
FY82	221,600	651,000	---	872,600
FY83	269,450	698,172[b]	---	967,622[b]
FY84	290,300	356,592	---	646,892
FY85	328,000	295,670	---	623,670
FY86	332,500	285,040	---	617,540
FY87	270,000	486,000[c]	---	756,000[c]
FY88	327,500[c]	318,000[c]	---	645,500[c]
FY89	310,000[c]	d	d	d
Nutrient Surveillance				
FY80	0	16,640	---	16,640
FY81	132,050	57,620	---	189,670
FY82	358,350	41,300	---	399,650
FY83	240,150	29,784[b]	---	269,934[b]
FY84	200,500	93,404	---	293,904
FY85	511,700	37,620	---	549,320
FY86	366,500	111,840	---	578,340
FY87	388,000	120,000[c]	---	508,000[c]
FY88	317,500[c]	0[c]	---	317,500[c]
FY89	350,000[c]	d	d	d

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[a] Estimates based on the Technical Plan; the Nutrition part was not separable from the data for the rest of the study for these years.

[b] Data for last two months of the year not retrievable; figures projected from 10 months of data.

[c] Planned Expenditures. FY87 actual expenditures in the process of being compiled.

[d] Planning process in progress; to be completed by August.

NIH

THE NATIONAL INSTITUTES OF HEALTH BIOMEDICAL AND BEHAVIORAL NUTRITION RESEARCH AND TRAINING AND RESEARCH ON NUTRITIONAL STATUS

The following table provides expenditures for FY 1980-1986 and estimated projections for FY 1987-1989 for the NIH Program in Biomedical and Behavioral Nutrition Research and Training. Of the projects included in the program, expenditures for those projects that involve research on nutritional status are presented in the second column. The third column is the percentage of expenditures for nutritional status research as a percentage of total expenditures for biomedical and behavioral nutrition research and training.

Anticipated expenditures for sub-areas in nutrition research are not available for FY 1987-1989. However, if one assumes that the proportion of nutrition research funds allocated to nutritional status research remains constant for FY 1986, 1987, 1988, and 1989, then a figure of 13% might be used.

Expenditures by the National Institutes of Health for Biomedical and Behavioral Nutrition Research and Training and for Projects in Research on Nutritional Status*
FY 1980 - 1986
(dollars in thosands)

Year	Biomedical Nutrition Research & Training	Nutritional Status Research+	Percent of Biomedical Nutrition Research and Training
1980	139,121	31,055	22
1981	148,501	34,520	23
1982	144,323	21,607	15
1983	164,306	30,871	19
1984	192,918	35,116	18
1985	207,316	29,769	14
1986	212,978	27,743	13
1987	260,025*	N/A	13**
1988	272,540*	N/A	13**
1989	293,191*	N/A	13**

* Estimates Provided by the NIH Division of Financial Management, 3/88.

** Projected percentage estimates based on FY 1986 activity level.

+ Includes research on methods for the determination of nutritional status and surveillance: dietary history and food consumption, biochemical determinants, anthropometry, and clinical examination.

NCC 4/11/88

STATEMENT

J. MICHAEL McGINNIS, M.D.
DEPUTY ASSISTANT SECRETARY FOR HEALTH
(DISEASE PREVENTION AND HEALTH PROMOTION)
PUBLIC HEALTH SERVICE
U. S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

RELEASE OF
THE SURGEON GENERAL'S REPORT ON NUTRITION AND HEALTH

Not for Release Before
11:00 a.m., July 27, 1988

I am pleased to join Dr. Koop here this morning in my capacity as Chairman of the Department of Health and Human Services' Nutrition Policy Board.

The Surgeon General's Report on Nutrition and Health represents a considerable achievement. It presents for the first time a comprehensive review by the Public Health Service of the scientific evidence that links diet to health, the policy implications of this evidence, and dietary recommendations based on consensus about the significance of that evidence. It addresses not just one disease process, but looks across the board at the spectrum of dietary issues related to the occurrence of a variety of chronic diseases. For the first time, documentation is offered for the convergence in dietary recommendations that emerges, even when several disease processes are taken into account. And for the first time, the Public Health Service identifies reduction of dietary fat intake as the primary dietary priority.

Before reviewing the specific recommendations, let me tell you a little about how this Report came about. The Surgeon General's Report on Nutrition and Health was developed in response to increasing recognition that the major nutritional problems among Americans were a result of dietary excesses and imbalances rather than deficiencies of single nutrients. [See chart entitled "Diet Recommendations Shift Priorities".]

In the early years of this century, dietary recommendations encouraged Americans to eat more foods containing fat and sugar in order to meet energy needs. The assignment of foods to five, eight, seven, or four groups was designed to encourage greater consumption of a variety of foods in order to avoid nutritional deficiencies. Food groups made little distinction between foods of high and low fat content, however, nor did they suggest any limitations on quantities to be consumed.

By the mid-1970s, it was becoming increasingly evident that several of the leading causes of death in the United States were linked at least in part to consumption of diets too high in fat, calories, salt, and alcohol. With publication of the United States Senate report, Dietary Goals for the United States, and the joint DHHS and USDA publication of the Dietary Guidelines for Americans, dietary recommendations began to focus on reduction of risk for these major chronic diseases.

This shift in nutritional priorities reflects the magnitude of the impact of diet-related diseases on the health of Americans. [See chart entitled "Ten Leading Causes of Death, U.S., 1987".]

Five of the ten leading causes of death in the United States--coronary heart disease, certain types of cancer, stroke, diabetes mellitus, and atherosclerosis--are diseases in which diet plays a part. Unintentional injuries, especially those involving motor vehicles, suicides, and chronic liver disease and cirrhosis are causes of death in which alcohol plays a part. Together, these conditions account for nearly two-thirds of annual deaths in this country.

The societal impact of the problems in which diet plays a part is substantial indeed. [See chart entitled "Chronic Diseases in America".]

- More than 1.25 million heart attacks occur each year in the U.S., and more than 500,000 people die as a result.

- More than 475,000 Americans died of cancer in 1987. During the same period, there were more than 900,000 new cases.

- More than 60 million Americans may have blood cholesterol levels that are too high.

- Approximately 2 million Americans suffer from stroke-related disabilities.

- About 58 million Americans have high blood pressure.

- Approximately 11 million Americans have diabetes.

- Approximately 34 million adults are obese--one quarter of the population.

- In 1985, illness and deaths from coronary heart disease cost Americans an estimated $49 billion in direct health care costs and lost productivity. The costs of cancer for 1985 were estimated at $72 billion.

Although the precise amount of diet's contribution to development of these conditions is uncertain, the effects of beneficial dietary changes is likely to prove substantial.

This Report documents the overwhelming amount of evidence that links dietary excesses and imbalances to these--and other--conditions. It reviews evidence from more than 2,500 studies of the relationship of specific dietary factors to specific disease conditions. This evidence is drawn from nutritional studies of experimental animals, from epidemiologic investigations of human populations, and from human clinical trials. It is a body of evidence that is at once sizable and compelling.

In reviewing this evidence, experts within the Public Health Service and in the private sector reached consensus on the following five recommendations on issues of importance to nearly all of us:

[See chart entitled "Recommendations for Most People".]

1. Fats and cholesterol: Reduce consumption of fat (especially saturated fat) and cholesterol. Choose foods relatively low in these substances, such as vegetables, fruits, whole grain foods, fish, poultry, lean meats, and low-fat dairy products. Use food preparation methods that add little or no fat.

   Diets high in saturated fat and cholesterol increase the risk for high blood cholesterol and, therefore, coronary heart disease. High intake of fat is associated with increased risk for obesity, bowel, breast and endometrial cancer, and possibly gallbladder disease. Dietary fat contributes more than twice the calories as equal amounts of protein or carbohydrate. At present, dietary fat accounts for at least 37 percent of the caloric intake of Americans--well above the limit of 30 percent recommended by the American Heart Association and American Cancer Society, and amounts consumed in countries such as Japan or China and several in the Mediterranean region, where heart disease rates are much lower.

2. Energy and weight control: Achieve and maintain a desirable body weight. To do so, choose a dietary pattern in which

energy (caloric) intake is consistent with energy expenditure. To reduce energy intake, limit consumption of foods relatively high in calories, fats, and sugars and minimize alcohol consumption. Increase energy expenditure through regular and sustained physical activity.

Overweight individuals are at increased risk for diabetes, high blood pressure and stroke, coronary heart disease, some types of cancer, and gallbladder disease. The overall risk of death increases with the severity of obesity.

3. Complex carbohydrates and fiber: Increase consumption of whole grain foods and cereal products, vegetables (including dried beans and peas) and fruits.

Dietary patterns emphasizing foods high in complex carbohydrates and fiber are associated with decreased risk of diverticulosis and some types of cancer. In particular, diets high in fiber may be associated with lower risk of colon cancer, and frequent consumption of certain vegetables and fruits may lower risk for cancers of the lung and bladder as well as some gastrointestinal cancers. Diets high in complex carbohydrates also tend to be lower in calories and fat content, and are therefore also associated in epidemiologic and animal studies with lower rates of coronary heart disease and diabetes.

4. Sodium: Reduce intake of sodium by choosing foods relatively low in sodium and limiting the amount of salt added in food preparation and at the table.

   Most sodium is consumed as salt--sodium chloride.

   High sodium intakes are related to the occurrence of high blood pressure and stroke. Although sodium is needed for normal metabolism, it is consumed in this country at levels far beyond those deemed safe and adequate by the National Research Council. Some people maintain normal blood pressure over a wide range of sodium intake. Others appear to be "salt sensitive" and develop high blood pressure when they eat too much salt. Despite this difference, it seems prudent to reduce salt intake. We do not yet know how to identify people who are salt sensitive; salt restriction can benefit salt sensitive people; and moderate sodium restriction is not harmful.

5. Alcohol: To reduce the risk for chronic disease, take alcohol only in moderation (no more than two drinks a day) if at all. Avoid drinking any alcohol before or while driving, operating machinery, taking medications, or engaging in any other activity requiring judgment. Avoid drinking alcohol when pregnant.

Because consumption of alcohol by Americans accounts for roughly one-tenth of aggregate caloric intake annually, it must be considered an important dietary factor--especially for those who consume more than the moderate levels of one or two drinks in any 24-hour period. Alcohol is a drug that can produce addiction in susceptible persons, birth defects in children whose mothers drink it during pregnancy, impaired judgment and the ability to drive or operate machinery, and adverse reactions in people taking certain medications. In addition, alcohol abuse can disrupt family functioning and can contribute to suicide and homicide. Excessive alcohol intake increases the risk for liver disease, some types of cancer, high blood pressure, stroke, and disorders of the heart muscle.

I would also like to mention recommendations that apply to some people:

[See chart entitled "Other Issues for Some People".]

1. Fluoride: Community water systems should contain fluoride at optimal levels for prevention of tooth decay. If such water is not available, use other appropriate sources of fluoride.

Overwhelming evidence documents the efficacy, safety, and cost-effectiveness of optimally fluoridated drinking water in prevention of tooth decay. Lifetime use of water containing an optimal fluoride concentration of about 1 part per million will cut the occurrence of dental caries in half. This is surely one of the most successful public health efforts ever introduced in the United States.

2. Sugars: Those who are particularly vulnerable to dental caries (cavities), especially children, should limit their consumption and frequency of use of foods high in sugars.

   The role of sugars in promoting tooth decay is well established, with newly erupting teeth most vulnerable. Sticky sweet foods that adhere to the teeth are most cariogenic and the longer such foods remain in the mouth, the more they are likely to induce decay.

3. Calcium: Adolescent girls and adult women should increase consumption of foods high in calcium, including low-fat dairy products.

   Chronically low calcium intake, especially during adolescence and early adulthood, may impair development of peak bone mass and predispose to osteoporosis in later life. Although the precise relationship of dietary calcium to osteoporosis is uncertain, it appears that higher intakes increase bone mass and delay onset of the disease.

4. Iron: Children, adolescents, and women of childbearing age should be sure to consume foods that are good sources of iron, such as lean red meats, fish, certain beans, and iron-enriched cereals and whole grain products. This issue is of special concern for low-income families.

   A deficiency of dietary iron is responsible for the most prevalent form of anemia in the United States. Although the incidence of iron deficiency anemia has been declining, the condition is most prevalent among low-income children, adolescents, and women of childbearing age.

I want to emphasize a special point about these recommendations: that taken together, they apply to several chronic diseases.

[See chart entitled "Convergence of Dietary Recommendations".]

A reduction in intake of foods containing fat accompanied by an increase in foods containing complex carbohydrates and fiber, for example, should be associated with reduced risk not only for coronary heart disease, but also for certain cancers, stroke, diabetes, and, perhaps, some gastrointestinal diseases.

These recommendations can be readily accomplished by increasing dietary intake of vegetables, fruits, beans, and grains, and choosing lean meats, poultry without skin, and fish and low-fat dairy products.

There no longer can be any doubt about the importance of diet to the health of Americans. This Report not only makes that point clearly; it also gives to the Public Health Service, as well as to other public and private health personnel in this Nation, a sound platform from which we can address improvements in a wide variety of programs--from research to education to services. Some activities that can help implement the recommendations of the Surgeon General's Report include:

- The member agencies of the Department's Nutrition Policy Board will be developing ways to disseminate the Report and to incorporate its recommendations into DHHS education, service, and research programs. In addition, the Report is being disseminated widely nationally.

- The National Heart, Lung, and Blood Institute's National Cholesterol Education Program encourages Americans to have their blood cholesterol levels measured and to reduce their dietary fat intake if the levels are too high. The Institute's campaign to reduce high blood pressure emphasizes salt restriction and weight reduction. Menus are being developed to facilitate people's efforts to make these changes.

- The National Cancer Institute's Cancer Awareness Program is educating the public to consume low-fat, high-fiber diets. A joint NHLBI/NCI effort to produce consumer materials will emphasize the convergence of recommendations.

- Revised labeling policies will be an important focus of activity in the year ahead for both the Food and Drug Administration and the U.S. Department of Agriculture. The FDA, for example, is developing a proposal for health messages on food labels. This Report will provide the scientific basis for any messages that will be approved.

- In a cooperative effort with the Department of Agriculture, the Department will be reviewing and updating the Dietary Guidelines for Americans, in light of the findings of the Surgeon General's Report.

- The Nutrition Policy Board has begun to examine the development of criteria for issue of quantification of dietary guidelines as an essential step in the development of scientifically-based quantitative targets for intake of fat, fiber, and other dietary factors.

- In addition to looking at our own service programs--like those that provide food to older people--we will be consulting with our USDA colleagues on ways in which food assistance programs can contribute to the Report's recommendations, and with other Federal agencies on nutrition programs for their client populations.

- We will be consulting with members of the food industry on ways in which they can bring their products in line with the recommendations.

- To improve our efforts to monitor our progress in improving the nutritional status of Americans, we have formed earlier this month an Administration-wide Interagency Committee on Nutrition Monitoring, co-chaired by DHHS and USDA.

- And to facilitate identification of groups most at risk of chronic disease, the Department has recently completed a review of its capability to assess the nutritional status of low-income populations. The results of that review will be disseminated shortly and we will be taking steps to fill the gaps identified.

In addition to focusing our Federal agenda, the Department is working with groups in the private sector to implement the Report's recommendations. Particularly notable with respect to the Report's major finding on dietary fat consumption is the formation of a public-private partnership of more than 20 national organizations to mount a multiagency-sponsored national campaign to reduce dietary fat consumption among Americans. This effort, catalyzed by leadership and funds from the Henry J. Kaiser Family Foundation in Menlo Park, California, will supplement, unite, and enhance the important individual efforts of public and private groups like the American Heart Association, the American Cancer Society, our own NHLBI and NCI, and various participants from the food industry. Details will be formally released later this summer.

I'd like to close my formal statement with a special word of emphasis on the key role of leadership from the private sector. Government can, must, and will contribute to implementing the findings and recommendations of this Report. But the ultimate decisions targeted by this Report are the private decisions that people take against the backdrop of myriad factors--like advertising, food availability, point of purchase information, clinical advice, cultural norms. Reaching the full potential that exists for better health for Americans will require the energy and commitment of every sector of our society.

TESTIMONY OF
REP. GEORGE E. BROWN, JR. (D-CA)
BEFORE THE
SENATE COMMITTEE ON GOVERNMENTAL AFFAIRS
ON
S.1081, THE NATIONAL NUTRITION MONITORING AND RELATED RESEARCH ACT OF 1987

MARCH 22, 1988

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE, I CONGRATULATE YOU FOR HOLDING THESE HEARINGS ON S. 1081, THE NATIONAL NUTRITION MONITORING AND RELATED RESEARCH ACT OF 1987. AS YOU KNOW, MY COLLEAGUES BUDDY MACKAY (D-FL) AND DOUG WALGREN (D-PA), AND I WERE THE INITIAL CO-SPONSORS OF AN IDENTICAL BILL IN THE HOUSE, H.R. 2151. I AM PLEASED TO HAVE THIS OPPORTUNITY TO PRESENT MY PERSPECTIVES ON THE IMPORTANCE AND NEED FOR THIS LEGISLATION.

THE ISSUE OF NATIONAL NUTRITION MONITORING HAS SURFACED APPROXIMATELY EVERY 5 YEARS SINCE 1940, USUALLY IN RESPONSE TO TESTIMONIALS REGARDING HUNGER AND MALNUTRITION IN THE UNITED STATES. EACH TIME CONCERNS OF THE PUBLIC WERE EXPRESSED, THE PRESIDENT, THE EXECUTIVE BRANCH, OR THE LEGISLATIVE BRANCH URGENTLY INITIATED SHORT-TERM AND PIECEMEAL SURVEYS TO OBTAIN OBJECTIVE DATA ON THE DIETARY AND NUTRITIONAL STATUS OF THE POPULATION. EXAMPLES OF THOSE INITIATIVES INCLUDE: IN 1967, A CONGRESSIONAL MANDATE THAT LED TO THE NATIONAL NUTRITION SURVEY, COMMONLY KNOWN AS THE TEN-STATE NUTRITION SURVEY; IN 1971, A PRESIDENTIAL DIRECTIVE THAT RESULTED IN A DECISION BY THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE TO TRANSFORM THE NATIONAL NUTRITION SURVEILLANCE SURVEY INTO WHAT IS KNOW TODAY AS THE NATIONAL HEALTH AND

Nutrition Examination Survey (NHANES); and in 1977, a congressional mandate, in the Food and Agriculture Act (P.L. 95-113), for a proposal for a comprehensive nutritional status monitoring system.

Unfortunately, the results of each of those surveys became available several years after the urgent situation that had prompted their mandate. Therefore, what was perceived to be an immediate public need was addressed through new policies and intervention strategies without the benefit of the survey that was designed to guide those actions. Although policymakers could not wait for the results of the surveys, the data could be valuable in the assessment of dietary and nutritional status over time. However, the usefulness of the data to the food and health communities and to public policymakers has proven to be limited because of inadequate methods, noncomparable standards, unlike population samples, and the lack of indicators to link food consumption patterns to nutrition and health.

Today, the Nationwide Food Consumption Survey (NFCS) conducted by the United States Department of Agriculture (USDA) and NHANES conducted by the Department of Health and Human Services (DHHS) are the cornerstones of nutrition monitoring. The attention that has been given to nutrition monitoring by the executive branch and the Congress alike has focused almost entirely on these two surveys. Other surveys, such as the Total Diet Study conducted by the DHHS Food and Drug Administration and the Consumer Expen-

DITURE SURVEY CONDUCTED BY THE BUREAU OF LABOR STATISTICS HAVE BEEN IGNORED. THERE IS LITTLE INDICATION THAT ALL SURVEYS ARE LINKED, COMPLIMENT RATHER THAN DUPLICATE EACH OTHER, OR OPERATE IN TANDEM AS PART OF A STRATEGIC, CONTINUOUS, OR COMPREHENSIVE SYSTEM.

OBTAINING AN ASSESSMENT OF THE NATION'S NUTRITIONAL AND HEALTH STATUS IS, OF COURSE, THE ULTIMATE GOAL OF NUTRITION MONITORING. WHILE MOST OF THE ATTENTION HAS BEEN PLACED ON THE ADMINISTRATION OF THE SURVEYS, THE INFRASTRUCTURE NECESSARY TO IMPROVE THE ACCURACY, USE, AND COST-EFFECTIVENESS OF THE RESULTING DATA HAS RECEIVED INADEQUATE SUPPORT. SCIENTIFIC METHODS AND TECHNOLOGY TO ASSESS NUTRITIONAL AND DIETARY STATUS WERE DECLARED COSTLY, IMPRECISE, AND NON-STANDARDIZED AT HEARINGS OF THE SUBCOMMITTEE ON SCIENCE, RESEARCH AND TECHNOLOGY IN 1979, WHICH I CHAIRED, AND LITTLE HAS CHANGED ALMOST 10 YEARS LATER.

THE FEDERAL GOVERNMENT MUST ACCEPT THE RESPONSIBILITY FOR DEVELOPING THE INFRASTRUCTURE AND SCIENCE BASE FOR THE SUPPORT OF NUTRITION MONITORING ACTIVITIES UNDERTAKEN AT BOTH FEDERAL AND STATE LEVELS. HOWEVER, NUTRITION MONITORING PLANS HAVE EITHER OMITTED DIETARY AND BIOCHEMICAL METHODS RESEARCH OR IDENTIFIED THESE DEFICIENCIES ILE, AT THE SAME TIME, EXCLUDING THEM FROM THE LIST OF PRIORITIES NECESSARY FOR COMPLETION BEFORE CONDUCTING THE NEXT SERIES OF PLANNED SURVEYS.

INVESTMENTS IN METHODS RESEARCH WILL NOT ONLY REDUCE THE COST AND

IMPROVE THE ACCURACY OF THE NATION'S NUTRITION MONITORING CAPABILITIES, BUT WILL ALSO CONTRIBUTE TO THE HEALTH OF THE PUBLIC AS WELL AS TO THE EFFECTIVENESS OF THEIR HEALTH CARE. IN ADDITION, AS THE ACCURACY OF THE METHODS USED ARE IMPROVED, THE SAMPLE SIZE OR FREQUENCY OF DATA COLLECTION COULD BE REDUCED, THUS POSSIBLY DECREASING THE COST OF FEDERAL AND STATE NUTRITION MONITORING ACTIVITIES. THIS ADMINISTRATION AND PRECEDING ADMINISTRATIONS APPARENTLY DID NOT REALIZE THAT THE PURPOSE OF INVESTING IN RESEARCH IS TO ACHIEVE LONG-TERM GAINS THAT WILL IMPROVE THE OUTCOMES AS WELL AS THE BENEFITS DERIVED FROM FUTURE NUTRITION MONITORING SURVEYS.

THE DIETARY AND BIOCHEMICAL METHODS SO IMPORTANT TO THE USEFULNESS OF NUTRITION MONITORING SURVEYS ARE THE SAME METHODS THAT ARE USED TO ASSESS AND GUIDE THE HEALTH OF INDIVIDUALS. THUS, INVESTMENTS IN METHODS RESEARCH WOULD NOT ONLY MAKE MORE EFFECTIVE USE OF FUNDS EXPENDED FOR NUTRITION MONITORING SURVEYS BUT COULD ALSO IMPROVE THE TOOLS OF NUTRITION RESEARCHERS AND HEALTH-CARE PRACTITIONERS. IT IS DIFFICULT FOR ME TO BELIEVE THAT A SUSTAINED AND PLANNED EFFORT WOULD NOT RESULT IN INNOVATIVE, LESS-INVASIVE, AND LESS-COSTLY INDICATORS AND MEASURES OF NUTRITIONAL AND HEALTH STATUS.

IN ADDITION TO USDA AND DHHS, MANY DEPARTMENTS SUPPORT RESEARCH IMPORTANT TO NUTRITIONAL STATUS MEASUREMENTS. THE VALUE OF THE WORK AND THE RESULTS COULD BE OPTIMIZED IF INTEGRATED INTO A COORDINATED PLAN. FOR EXAMPLE, IN ADDITION TO THE THOUSANDS OF

BLOOD CHOLESTEROL TESTS CONDUCTED BY NHANES, NEARLY 100 MILLION OF THESE TESTS ARE PERFORMED YEARLY IN CONJUNCTION WITH THE DISEASE PREVENTION AND HEALTH PROMOTION PROGRAMS OF INDIVIDUALS. FOR MANY YEARS CONCERN HAS BEEN EXPRESSED ABOUT THE ACCURACY OF THE TEST RESULTS. REFERENCE MATERIALS WITH KNOWN VALUES TO ASSURE THAT THE ANALYTICAL INSTRUMENTS USED TO MEASURE CHOLESTEROL GIVE RELIABLE RESULTS WERE NOT AVAILABLE. THROUGH A 10-YEAR COOPERATIVE EFFORT OF THE NATIONAL BUREAU OF STANDARDS AND THE COLLEGE OF AMERICAN PATHOLOGISTS, RESEARCH TO DEVELOP MATERIALS FOR IMPROVING THE RELIABILITY OF CHOLESTEROL TESTS WAS RECENTLY COMPLETED, AND THESE STANDARD REFERENCE MATERIALS BECAME AVAILABLE FOR THE FIRST TIME IN 1987.

METHODS RESEARCH IS BUT ONE COMPONENT OF THE INFRASTRUCTURE THAT IS NEEDED TO REALIZE A TRULY COMPREHENSIVE SYSTEM. OTHER COMPONENTS INCLUDE A CENTRAL FEDERAL FOCUS FOR THE DEVELOPMENT, COORDINATION, AND IMPLEMENTATION OF A STRATEGIC PLAN AND PROGRAM; TIMELY AND CONTINUOUS COLLECTION, ANALYSIS, AND INTERPRETATION OF DATA; TECHNOLOGY TRANSFER MECHANISMS TO ASSIST AND ENHANCE EFFORTS OF STATE AND LOCAL GOVERNMENT; AND A FORUM FOR OBTAINING RECOMMENDATIONS FROM SCIENTISTS AND DATA USERS IN THE PUBLIC AND PRIVATE SECTORS. THESE ARE THE COMPONENTS AND GOALS OF THE NATIONAL NUTRITION MONITORING AND RELATED RESEARCH ACT OF 1987.

MANY STATES ARE PLACING INCREASED EMPHASIS ON THE NEED FOR NUTRITIONAL AND HEALTH STATUS DATA TO USE AS A BASIS FOR ESTABLISHING FOOD AND HEALTH SERVICE PRIORITIES AND DETERMINING HOW TO TARGET

THE LIMITED FUNDS AVAILABLE WHERE THEY ARE MOST NEEDED. FOR EXAMPLE, IN SEPTEMBER, 1986 THE GOVERNOR OF CALIFORNIA SIGNED INTO LAW THE CALIFORNIA NUTRITION MONITORING DEVELOPMENT ACT OF 1986. THE LAW REQUIRES THE STATE DEPARTMENT OF HEALTH SERVICES TO "DETERMINE THE AVAILABILITY AND TYPES OF NUTRITION MONITORING INFORMATION CURRENTLY AVAILABLE AND WHAT INFORMATION IS NEEDED AND TO ASSESS THE FEASIBILITY OF ESTABLISHING A PROTOTYPE DATA SYSTEM."

AT THE REQUEST OF THE ASSOCIATION OF STATE AND TERRITORIAL PUBLIC HEALTH NUTRITION DIRECTORS, USDA AND DHHS HAVE BEGUN TO CONDUCT CONFERENCES TO ASSIST STATES IN DEVELOPING DIETARY AND NUTRITIONAL STATUS DATA, AS REQUIRED IN S. 1081 AND H.R. 2151. IF EFFECTIVE USE OF FEDERAL AND STATE FUNDS FOR NUTRITION MONITORING IS TO BE REALIZED, A "NATIONAL MINIMUM DATA SET FOR NUTRITION" AS RECOMMENDED BY THE ASSOCIATION OF STATE AND TERRITORIAL PUBLIC HEALTH NUTRITION DIRECTORS, AND ENCOMPASSED IN THESE BILLS, MUST ALSO BE DEVELOPED. SUCH A DATA SET SHOULD BECOME AN INTEGRAL PART OF A NATIONAL NUTRITION STATUS NETWORK AND IS IMPERATIVE IF THE POTENTIAL BENEFITS OF IMPROVED NUTRITION ARE TO BE ACHIEVED. THE ADMINISTRATION HAS BEEN RELUCTANT TO DEVELOP SUCH A DATA SYSTEM AND NETWORK.

IN TESTIMONY BEFORE THE HOUSE SCIENCE AND TECHNOLOGY AND AGRICULTURE COMMITTEES, THE ADMINISTRATION HAS REPEATEDLY INDICATED THAT PROGRESS HAS BEEN MADE TO ENHANCE CURRENT NUTRITION MONITORING ACTIVITIES. AS I REVIEW THESE STATEMENTS OF PROGRESS, THE ACTIV-

ITIES APPEAR TO FOCUS ON INTERAGENCY MEETINGS AND THE DEVELOPMENT OF REPORTS AND REVISED PLANS. HOWEVER, THE OUTCOMES OF THESE MEETINGS APPEAR TO HAVE RESULTED IN LITTLE CONCRETE EVIDENCE OF PROGRESS TOWARD CREATING A UNIFIED NATIONAL NUTRITION MONITORING PROGRAM. A FEW EXAMPLES FOLLOW:

o THE MAJOR GOAL OF THE 1981 USDA/DHHS JOINT IMPLEMENTATION PLAN FOR A COMPREHENSIVE NATIONAL NUTRITION MONITORING SYSTEM WAS TO "CONDUCT IN FY 1987 THE FIRST COORDINATED NFCS-NHANES SURVEY, BASED ON PREVIOUS RESEARCH AND FIELD-TESTS UNDERTAKEN IN FY 1983-1985." THIS GOAL FOCUSED ON THE SURVEYS OF USDA AND DHHS ONLY AND DID NOT INCORPORATE THE RELATED SURVEYS OF OTHER FEDERAL AGENCIES. A COORDINATED SURVEY DID NOT BEGIN IN FISCAL YEAR 1987; RATHER, AS INDEPENDENT ENTITIES THE NFCS BEGAN DATA COLLECTION AND NHANES-III BEGAN FIELD TESTING IN 1987. THE FAILURE OF DHHS TO REQUEST ADEQUATE FUNDS IN THE FISCAL YEAR 1985 BUDGET FOR THE DESIGN AND TESTING OF NHANES-III DELAYED IMPLEMENTATION. THE FISCAL YEAR 1989 BUDGET REQUEST WOULD FURTHER DELAY THE FULL IMPLEMENTATION OF NHANES-III. IN ADDITION, RELATED SURVEYS OF OTHER FEDERAL AGENCIES WERE NOT COORDINATED WITH THESE TWO MAJOR SURVEYS.

o THE STATED GOAL OF THE 1981 JOINT IMPLEMENTATION PLAN TO BE ACCOMPLISHED IN 1984-85 WAS: "TO RESOLVE METHODOLOGICAL PROBLEMS, DHHS AND USDA WILL CONDUCT A JOINT PILOT STUDY IN TWO LOCATIONS TO TEST MAXIMAL COORDINATION OF NHANES AND NFCS." THE PILOT STUDY WAS NOT CONDUCTED, YET THE FACT THAT ONE OR BOTH DE-

PARTMENTS WILL BE IN THE FIELD, COLLECTING DATA EVERY YEAR THROUGH 1996 IS NOW GIVEN AS AN INDICATION OF PROGRESS AND INCREASED COORDINATION. SEVERAL SCIENTIFIC BODIES HAVE RECOMMENDED THAT COMPARABILITY AMONG THE SURVEYS BE IMPROVED THROUGH A COMMON METHODOLOGICAL CORE. THE 1987-88 SURVEYS ARE USING A COMMON FOOD COMPOSITION DATA FILE FOR THE FIRST TIME. HOWEVER, THE 1987 OPERATIONAL PLAN INDICATES THAT FINAL REVIEW AND CLEARANCE PROCESSES PRECLUDED FULL ACCEPTANCE OF THE PROPOSALS OF A USDA/DHHS TASK FORCE TO IMPROVE COMPARABILITY OF SOCIODEMOGRAPHIC VARIABLES, AND THAT LIMITED PROGRESS HAD BEEN ACHIEVED IN COMPATIBLE SAMPLING DESIGN.

o IN 1987, THE JOINT IMPLEMENTATION PLAN WAS EXTENDED TO AN OPERATIONAL PLAN FOR THE NATIONAL NUTRITION MONITORING SYSTEM. AS IN THE 1981 JOINT IMPLEMENTATION PLAN, THE OPERATIONAL PLAN INCLUDES NEITHER THE IDENTIFICATION OF RESOURCES NEEDED OR A COMMITMENT THAT THE RESOURCES WILL BE REQUESTED. WITHOUT A COMMITMENT, DELAYED DATA COLLECTION AND REDUCTION OF THE SAMPLE SIZE BELOW THAT NECESSARY TO GIVE VALID ESTIMATES OF THE DIETARY AND NUTRITIONAL STATUS OF HIGH RISKS GROUPS WILL BE PERPETUATED.

o SCIENTIFIC EXPERTISE HAS BEEN USED TO ASSIST WITH DATA INTERPRETATION AND TO RECOMMEND MECHANISMS FOR IMPROVING THE CURRENT SYSTEM. HOWEVER, A SCIENTIFIC ADVISORY BODY HAS NOT BEEN UTILIZED TO REVIEW THE DESIGN OF THE SURVEYS IN THE AGGREGATE OR ASSESS THE MERITS OF PROPOSED ACTIVITIES. THE COST OF A COMPREHENSIVE NATIONAL NUTRITION MONITORING SYSTEM IS NOT INSIGNIFI-

CANT. AS CURRENTLY IMPLEMENTED, THE USDA AND DHHS SURVEYS ALONE REQUIRE APPROXIMATELY $150 MILLION THROUGHOUT THE DATA COLLECTION PHASE. OTHER BIOMEDICAL OR AGRICULTURAL RESEARCH PROJECTS OF THIS MAGNITUDE AND SIGNIFICANCE ARE SUBJECT TO MERIT REVIEW BY SCIENTIFIC PEERS. NEITHER THE CURRENT SURVEY DESIGNS NOR THE OPERATIONAL PLAN FOR A COMPREHENSIVE NATIONAL NUTRITION MONITORING SYSTEM HAVE THE BENEFIT OF A SCIENTIFIC ADVISORY COUNCIL AS CALLED IN FOR S. 1081.

MORE THAN TEN YEARS HAVE PASSED SINCE THE FIRST CONGRESSIONAL MANDATE FOR A PROPOSAL FOR A COMPREHENSIVE NUTRITION MONITORING SYSTEM. PRESENTLY, THE SURVEY COMPONENTS ARE BEGINNING NEW DATA COLLECTION PHASES. AS THE 1987 USDA/DHHS OPERATIONAL PLAN INDICATES THE COMPARABILITY AND COORDINATION OF THE SURVEYS ARE FAR FROM OPTIMUM AND THE INFRASTRUCTURE TO SUPPORT AN EFFECTIVE AND EFFICIENT SYSTEM IS NOT YET OPERATIONAL.

THERE ARE NO PUBLIC LAWS WHICH MANDATE OR ESTABLISH A NATIONAL NUTRITION MONITORING SYSTEM. THE PROGRAMS, THROUGH THE YEARS, HAVE BEEN DRIVEN BY THE WHIMS OF THE CONGRESS, THE EXECUTIVE BRANCH, AND THE OFFICE OF MANAGEMENT AND BUDGET (OMB). FOR YEARS CONGRESS HAS BEEN BLINDLY AUTHORIZING AND APPROPRIATING FUNDS FOR A PIECEMEAL APPROACH WITHOUT ANY IDEA OF THE SPECIFIC BUDGETARY RESOURCES THE SEVEN OR MORE AGENCIES INVOLVED WERE ALLOCATING TO THIS IMPORTANT NATIONAL RESOURCE. AS A RESULT, CONGRESS HAS NO DIRECT MEANS TO ASSESS EITHER THE DIRECTION OR THE ADEQUACY OF FEDERAL NUTRITION MONITORING ACTIVITIES.

In my view, a legislative mandate is necessary to ensure a national nutrition monitoring system exists from one Congress to another and from this administration to the next. Although a legislative mandate cannot change the will to put aside turf for the sake of national priorities, a legislative directive would focus responsibility and accountability within the Federal Government. If all components of the proposed law are currently being accomplished, I fail to understand why the administration opposes incorporating present activities and projecting future activities into a coordinated program and comprehensive plan.

In summary, I believe the status quo is not adequate or acceptable. Prohibiting the use of any funds for nutrition monitoring and related research until an interagency budget and comprehensive plan detailing specific agency commitments, resource requirements, and target dates has been merit reviewed and submitted to Congress is not in the best interest of the public. Assigning the major federal responsibility for nutrition monitoring to one department would fix responsibility, eliminate coordination problems, and create a central focus. However, agricultural and health groups have not been able to reach a consensus on the appropriate department. Thus, I believe the Congress must act now to prepare the National Nutrition Monitoring and Related Research Act of 1987 for the President's signature.

As you know, a similar bill, H.R. 2436, passed the House on June 26, 1986 by a vote of 305 to 85. As a member of both the Commit-

TEE ON SCIENCE, SPACE, AND TECHNOLOGY AND THE COMMITTEE ON AGRICULTURE, TO WHOM H.R. 2151 WAS JOINTLY REFERRED, I AM COMMITTED TO WORK WITH THE SENATE AND MY COLLEAGUES IN THE HOUSE TO INSURE PASSAGE OF THIS IMPORTANT LEGISLATION IN THE 100TH CONGRESS.

American Academy of Pediatrics

TESTIMONY

BEFORE THE

SENATE COMMITTEE ON GOVERNMENTAL AFFAIRS

ON

S.1081:
THE NATIONAL NUTRITION MONITORING AND RELATED
RESEARCH ACT OF 1987

PRESENTED BY

LAURENCE FINBERG, M.D., F.A.A.P.

MARCH 22, 1988

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Good morning, I am Laurence Finberg. I am here today representing the American Academy of Pediatrics. As the Chairman of the Academy's Committee on Nutrition, I would like to express our support for S.1081, the National Nutrition Monitoring and Related Research Act of 1987.

The American Academy of Pediatrics has long been concerned with the nutritional and health status of women, infants and children. It is critical that timely information concerning the nutritional status of our population be available if policies and programs are to continue to be effective.

A comprehensive, national nutrition monitoring does not currently exist. This lack of information makes it difficult for policy makers to be knowledgeable of the nutritional status of the entire population and to understand and address the safety and quality of the nation's food supply. It hinders our ability to meet the nutritional needs of the population and the specific needs of children.

Infancy and childhood are the periods of most rapid growth, and that growth is strongly linked to nutrition, which will determine the body size and the body composition. We are at the initial stages of discovering the impact of childhood nutrition on the chronic diseases of adult life. Valid and reliable data on the population as a whole and on regional and ethnic group populations in particular, will yield sound epidemiologic observations. These in turn will lead to hypotheses regarding preventive nutritional measures that can be tested.

We are also at the beginning of a high technology revolution in the food processing industry. Many new types of food are being developed for diets designed to avoid degenerative illnesses in adult life. Programs that are initiated by the government or private agencies to influence the dietary habits of 250 million people may well have unanticipated consequences. While the theoretical basis for these preparations exists, we do not yet know of unpredictable side effects and indeed whether or not their introduction will achieve the intended aim. Accurate data carefully collected during one to two year intervals over a long period of time, would help ascertain these effects. These can best be detected at the earliest moment by continued surveillance.

A rich and advanced country such as ours should not tolerate serious undernutrition in any subpopulation. There has been continuing speculation among various groups as to the extent of such undernutrition. A monitoring system should provide up to date information on this a problem.

A system of ongoing data collection and analysis that will permit the planning and guiding of agriculture, nutrition and health research is urgently needed. The collection, analysis and reporting of nutritional data requires a coordinated system at the Federal, state and local levels. The system is necessary to evaluate linkages among food consumption patterns, nutritional status and health status. S. 1081 establishes a coordinated national nutrition monitoring and related research program. The primary purpose of this act is to make more effective use of Federal and STate expenditures for nutrition monitoring and to improve the performance and benefits of current Federal nutrition monitoring and related research activities. The bill includes the following provisions:

TITLE I Establishes a 10-year coordinated national nutrition monitoring and related research program and a comprehensive plan for the national nutrition monitoring and related research program to facilitate the implementation of the coordinated program.

TITLE II Establishes National Nutrition Monitoring Advisory Council to provide scientific and technical advice, and to serve in an advisory capacity to the secretaries.

TITLE III Requires the publication at least every two years of a report which shall contain nutritional and dietary information and every five years a report entitled "Dietary Guidelines For Americans" suitable for the general public.

The National Institute of Health is currently involved in developing strategies for reducing coronary artery diseases in Americans in part through advice concerning diet. As pointed out in the preceding paragraphs, dietary changes involving large populations may have unanticipated effects. One reason for this is because interpretation by the public of nutritional advice may differ from that intended. It will be important to discover whether planned interventions will be successful in lowering cholesterol levels. Even more important will be learning whether lowering cholesterol levels, with a reduction in coronary artery disease, will in fact increase life expectancy. The answers to these questions will be of enormous importance to the generations of Americans living in the 21st century. Modern epidemiologic techniques for nutritional surveillance will assist us in dealing with new biological problems as they arise. A prepared society will be in a much better position to defend itself against the new biologic phenomena that will surely present themselves.

The need to reinforce our commitment to a National Nutrition Monitoring Program is greater than ever. S. 1081 provides the foundation for a reasonable, cost effective method of assessing the nutritional needs of our population and monitoring general health trends. The Academy urges you to consider favorably this important legislation.

TESTIMONY OF

PATRICIA B. SWAN

AMERICAN INSTITUTE OF NUTRITION

AMERICAN SOCIETY FOR CLINICAL NUTRITION

MR. CHAIRMAN, THANK YOU FOR THIS OPPORTUNITY TO TESTIFY IN SUPPORT OF THE NATIONAL NUTRITION MONITORING AND RELATED RESEARCH ACT OF 1987 (S.1081). MY NAME IS PATRICIA B. SWAN AND I AM CHAIR OF THE JOINT PUBLIC AFFAIRS COMMITTEE OF THE AMERICAN INSTITUTE OF NUTRITION AND THE AMERICAN SOCIETY FOR CLINICAL NUTRITION. I AM ALSO A PROFESSOR IN THE DEPARTMENT OF FOOD SCIENCE AND NUTRITION AND ASSOCIATE DEAN OF THE GRADUATE SCHOOL AT THE UNIVERSITY OF MINNESOTA.

MY TESTIMONY TODAY IN SUPPORT OF THIS BILL IS IN KEEPING WITH THE POSITION OF THE GOVERNING COUNCILS OF THE AMERICAN INSTITUTE OF NUTRITION AND THE AMERICAN SOCIETY FOR CLINICAL NUTRITION, BOTH OF WHOM HAVE PASSED RESOLUTIONS IN SUPPORT OF A NATIONAL NUTRITION MONITORING SYSTEM. MY SPECIFIC COMMENTS ARE BASED ON A STATEMENT ISSUED LAST SUMMER BY OUR JOINT PUBLIC AFFAIRS COMMITTEE. THESE TWO SOCIETIES ARE THE MAJOR PROFESSIONAL ORGANIZATIONS FOR NUTRITION SCIENTISTS IN CLINICAL, EDUCATIONAL AND RESEARCH INSTITUTIONS IN THE UNITED STATES. COLLECTIVELY OUR MEMBERS REPRESENT THE PREDOMINANT EXPERTISE IN THE FIELD OF NUTRITION SCIENCE.

OUR PRIMARY REASON FOR SUPPORTING THE NATIONAL NUTRITION MONITORING AND RELATED RESEARCH ACT OF 1987 IS OUR STRONG OPINION THAT THE UNITED STATES NEEDS A NATIONAL NUTRITION MONITORING SYSTEM. NO SUCH SYSTEM CURRENTLY EXISTS. SUCH A SYSTEM IS VITAL TO OUR UNDERSTANDING OF THE NUTRITIONAL HEALTH OF OUR NATION. WE NEED TO KNOW HOW WE USE FOOD IN THIS COUNTRY, HOW OUR USES OF FOOD ARE CHANGING, AND THE GENERAL NUTRITIONAL STATUS OF THE AMERICAN PEOPLE. GOOD FOOD CHOICES ARE BASIC TO OUR NATION'S HEALTH. SURELY THOSE CONCERNED ABOUT OUR NATION'S HEALTH, SUCH AS YOU WHO ARE POLICY-MAKERS IN THE CONGRESS, NEED TO HAVE ACCURATE AND TIMELY INFORMATION ON WHICH TO BASE THAT POLICY.

A SECOND REASON WE SUPPORT THIS ACT IS THAT WE BELIEVE THAT PROGRAMS

NOW CARRIED OUT BY THE FEDERAL GOVERNMENT, IF COORDINATED, COULD PROVIDE MUCH MORE USEFUL INFORMATION THAN THEY NOW DO. THE COMPONENTS OF A NATIONAL SYSTEM ALREADY EXIST, BUT THEY NEED TO BE COORDINATED TO ACHIEVE THE GOAL OF A NATIONAL NUTRITION MONITORING SYSTEM. CHIEF AMONG THESE COMPONENTS ARE THE HEALTH AND NUTRITION EXAMINATION SURVEY CONDUCTED BY THE DEPARTMENT OF HEALTH AND HUMAN SERVICES AND THE NATIONWIDE FOOD CONSUMPTION SURVEY CONDUCTED BY THE DEPARTMEN OF AGRICULTURE. SEVERAL OTHER COMPONENTS EXIST AMONG THE PROGAMS OF THESE TWO DEPARTMENTS AND TO A LESSER EXTENT WITHIN SEVERAL OTHER AGENCIES OF THE FEDERAL GOVERNMENT. A RECENT REPORT FROM THE NATIONAL ACADEMY OF SCIENCES RECOMMENDED WAYS IN WHICH COORDINATION MIGHT IMPROVE THE VALUE OF THESE PROGRAMS. SIMILARLY, THE JOINT NUTRITION MONITORING EVALUATION COMMITTEE, REPORTING TO DHHS AND USDA, RECOMMENDED WAYS TO IMPROVE INFORMATION ABOUT THE NUTRITIONAL STATUS OF OUR POPULATION THROUGH COORDINATION OF EXISTING GOVERNMENT PROGRAMS. THESE RECOMMENDATIONS NEED TO BE IMPLEMENTED.

A THIRD REASON FOR SUPPORTING S.1081 IS THAT IT ASSIGNS RESPONSIBILITY FOR THE NATIONAL COORDINATION OF NUTRITION MONITORING TO A SPECIFIC INTERAGENCY BOARD. ALTHOUGH THOSE RESPONSIBLE FOR THE SURVEYS MENTIONED ABOVE HAVE EXPRESSED A DESIRE TO COORDINATE THEIR PROGRAMS, AND ALTHOUGH THEY HAVE PRESENTED PLANS TO THE CONGRESS FOR ACCOMPLISHING THIS COORDINATION, TO DATE WE HAVE SEEN NO DATA RESULTING FROM COORDINATED EFFORTS. WE BELIEVE THIS IS DUE, IN PART, TO THE FACT THAT NO PERSON OR GROUP HAS THE RESPONSIBILITY FOR COORDINATION. THERE ARE MANY NATURAL OBSTACLES TO SUCH COORDINATION AMONG DEPARTMENTS. SOMEONE HAS TO ASSUME THE RESPONSIBILITY FOR OVERCOMING THESE OBSTACLES. WE HAVE CEASED TO BELIEVE THAT COORDINATION WILL COME ABOUT SIMPLY BECAUSE THE AGENCIES INVOLVED PROFESS THEIR DESIRE FOR THAT COORDINATION.

A FOURTH REASON FOR SUPPORTING S.1081 IS THAT IT REQUIRES PERIODIC

EVALUATION OF INFORMATION GATHERED THROUGH NUTRITION MONITORING. POLICY MAKERS DO NOT OFTEN HAVE THE TIME OR THE EXPERTISE TO EXAMINE THE INFORMATION THAT COMES FROM NUTRITION MONITORING AND TO EVALUATE WHAT IT SAYS ABOUT THE NUTRITIONAL STATUS OF THE AMERICAN PEOPLE. EXPERTS NOT DIRECTLY CONNECTED WITH THE FEDERAL PROGRAMS ARE REQUIRED TO CARRY OUT THIS EXAMINATION AND EVALUATION, IN ADDITION TO THOSE WHO ARE WITH THE PROGRAMS AND WHO ALSO HAVE A RESPONSIBILITY TO EVALUATE THEIR FINDINGS.

OTHER IMPORTANT FEATURES OF THE NATIONAL NUTRITION MONITORING AND RELATED RESEARCH ACT OF 1987 INCLUDE COORDINATION WITH THE STATES, THE ESTABLISHMENT OF AN ADVISORY COUNCIL, AND RESEARCH TO IMPROVE OUR ABILITY TO MONITOR THE NUTRITIONAL STATUS OF A POPULATION. SEVERAL STATES ARE NOW CARRYING OUT THEIR OWN NUTRITION MONITORING PROGRAMS, OR AT LEAST THEIR OWN NUTRITION SURVEYS. A FEDERAL-STATE PARTNERSHIP IN THESE EFFORTS WOULD BENEFIT BOTH THE STATES AND THE FEDERAL GOVERNMENT. AT THE VERY LEAST THE FEDERAL PROGRAMS MIGHT HELP TO IDENTIFY THE MOST RELIABLE METHODS FOR NUTRITION MONITORING. EVEN BETTER WOULD BE COORDINATION THAT PERMITS COMPARISON BETWEEN STATE AND FEDERAL MONITORING PROGRAMS. OUR ABILITY TO MONITOR THE NUTRITIONAL STATUS OF A POPULATION IS CURRENTLY LIMITED BY LACK OF INEXPENSIVE, RELIABLE AND EFFECTIVE METHODS TO ASSESS WHAT PEOPLE EAT AND THEIR NUTRITIONAL STATUS. THERE IS A SERIOUS AND PRESSING NEED FOR RESEARCH TO IMPROVE OUR CURRENT METHODS AND TO DEVELOP NEW AND BETTER ONES. THE ADVISORY COUNCIL DESCRIBED IN TITLE II WOULD PROVIDE EXPERTISE TO HELP BRING ABOUT THESE IMPROVEMENTS.

FINALLY, TITLE III OF S.1081 REQUIRES THAT THE SECRETARIES OF AGRICULTURE AND HEALTH AND HUMAN SERVICES PUBLISH DIETARY GUIDELINES EVERY FIVE YEARS AND PROMOTE THOSE GUIDELINES WHEN CARRYING OUT FEDERAL FOOD, NUTRITION AND HEALTH PROGRAMS. WE STRONGLY FAVOR THE DEVELOPMENT OF DIETARY GUIDANCE BY THE FEDERAL GOVERNMENT AND WE BELIEVE IT IS IMPORTANT

THAT THE GOVERNMENT BE AS CONSISTENT AS POSSIBLE WHEN PROVIDING NUTRITION INFORMATION TO THE AMERICAN PEOPLE. TO THIS END, THE PROVISION FOR REVIEW OF ANY PROPOSED DIETARY GUIDANCE SHOULD HELP IN ASSURING THAT SUCH GUIDANCE WILL BE CONSISTENT AND BASED ON THE BEST SCIENTIFIC EVIDENCE AVAILABLE.

BIOGRAPHY

PATRICIA B. SWAN is a professor in the Department of Food Science and Nutrition and Associate Dean of the Graduate School of the University of Minnesota where she has been a member of the faculty since 1964. She received her undergraduate degree from the University of North Carolina at Greensboro and her master's and doctoral degrees (Ph.D.) from the University of Wisconsin with majors in biochemistry and nutrition. During her graduate studies she investigated the vitamin B6 requirements of men and the metabolism of large amounts of selenium in animals.

After completing her doctoral work, Professor Swan spent a post-doctoral year in the Kennedy Laboratories at Wisconsin, working on animal models of genetic errors which result in mental retardation. She then came to the University of Minnesota where she spent a year doing post-doctoral research in the Department of Biochemistry before joining the nutrition faculty. Since she joined the faculty she has taught both undergraduate and graduate courses in human nutrition, and has directed research on amino acid metabolism, protein synthesis, and on the ways in which diet affects the metabolism of muscles. Her current scholarship emphasizes the history of nutrition research in the United States.

Professor Swan is an active member of the American Institute of Nutrition, where she has served a term as secretary, and currently serves as chair of the Joint Public Affairs Committee of the AIN and the American Society of Clinical Nutrition. She also serves as a member of the Human Nutrition Board of Scientific Counselors for the Department of Agriculture and as a member of the editorial board of the Journal of Nutrition .

JANICE N. NEVILLE, DSc, MPH, RD
PRESIDENT
OF
THE AMERICAN DIETETIC ASSOCIATION

Introduction

Good morning, Chairman Glenn, Senator Bingaman, and members of the Senate Committee on Governmental Affairs.

I am Janice Neville, President of the American Dietetic Association, and Professor, Department of Nutrition, Case Western Reserve University, Cleveland, Ohio. On behalf of the 57,000 members of The American Dietetic Association (ADA), I would like to thank you for the opportunity to address you today in support of Senator Bingaman's bill, the National Nutrition Monitoring and Related Research Act of 1987. The American Dietetic Association promotes optimal health and nutritional status of the population through the provision of direction and leadership for quality dietetic practice, education, and research.

The American Dietetic Association supports the goals of a national nutrition monitoring system, structured to meet the expanding needs of food, nutrition and health professionals, and state and local governments to determine agriculture, dietary, nutrition and health policy. It will provide information essential for the timely and accurate implementation of the 1990 Health Objectives for the Nation, the development and implementation of the Year 2000 Health Objectives for the Nation, and the Dietary Guidelines for Americans (1, 2). In addition to The American Dietetic Association, there are over thirty-five public health, scientific, professional, voluntary, consumer, anti-hunger, elderly, educational, religious, and state and local government groups in the Coalition for Nutrition Monitoring that also support S. 1081 (Figure 1).

Representative Buddy MacKay, in previous remarks on nutrition monitoring, has stated that the lack of passage of a national nutrition monitoring system is a frustrating problem on an issue that should not be troublesome at all. At the March 2nd hearing on nutrition monitoring little reference was made to data from US Department of Agriculture (USDA) and US Department of Health and Human Services (DHHS) surveys. This would suggest that the data from federal is not as useful as it could be for the purposes of their research. This underscores the need for stronger coordination of nutrition monitoring activities of USDA and DHHS.

Background

Nutrition monitoring dates back to 1936 when the first household food consumption survey was conducted by the United States Department of Agriculture (USDA).(3) The Food and Agriculture Act of 1977 directed the Secretaries of Agriculture and Health, Education, and Welfare (now Health and Human Services, DHHS) to submit to Congress a proposal for a comprehensive nutrition monitoring system to include:

> 1) an assessment system consisting of periodic surveys and continuous monitoring to determine: The extent of risk of nutrition-related health problems in the United States; which population groups or areas of the country face greatest risk; and the likely causes of risk and changes in the above risk factors over time;
> 2) a surveillance system to identify remediable nutrition-related health risks to individuals or for local areas, in such a manner as to tie detection to direct interventions and treatment...; and
> 3) program evaluations to determine the adequacy, efficiency, effectiveness, and side effects of nutrition-related programs in reducing health risks to individuals and populations (4).

In 1978, the proposal for a comprehensive nutrition monitoring system was transmitted from USDA and DHHS to the Senate. In September, 1981, the USDA-DHHS Joint Implementation Plan for a Comprehensive National Nutrition Monitoring System was completed and delivered to Congress (5).

Current Status of the National Nutrition Monitoring System

The current status of nutrition monitoring activities as called for in the Joint Implementation Plan for a Comprehensive National Nutrition Monitoring System (JIPCNNMS) are outlined in Table 1 and summarized below:

Coordination of the 1987 Nationwide Food Consumption Survey (NFCS) and the National Health and Nutrition Examination Survey (NHANES) III: Although the surveys will use the same food coding system and the same food composition data bases, they will not be conducted at the same time. NFCS began in 1987 and NHANES III is scheduled to begin this year. The agencies have missed the time frame to coordinate the core data sets of the NNMS and will have to wait ten years until 1997 for the next opportunity to coordinate these surveys. Surveys in other USDA and DHHS branches currently have not been coordinated with the same data bases.

The JIPCNNMS also focuses on other interconnected elements: health status measurements, food consumption measurements, food composition measurements, dietary knowledge and attitudes assessments, and food supply determinations. In a 1982 report on the feasibility of coordinating the two surveys, the conclusion drawn by statisticians was that it would be impractical to combine the two surveys because of logistical drawbacks, but outlined several recommendations to better coordinate the surveys (6). These recommendations focused on the comparability of survey components, primarily in the areas of socio-economic and dietary data, and survey design components.

Timeliness of data collection: USDA has collected data through NFCS once every 10 years since 1955. Health and nutrition data collection through NHANES has been variable, with surveys conducted from 1971 to 1975 (NHANES), 1975 to 1980 (NHANES II), and NHANES III scheduled to begin in 1988. USDA's Continuing Survey of Food Intakes of

Individuals (CSFII), which plans to provide data each year between NFCS 1987 and NFCS 1997, for the most part covers only women from 19 to 50 years, and children from 1 to 5 years. Food intake data of infants, men, and older Americans is not continuously collected.

Timeliness of data release: The time between data collection, analysis and release has been a major problem for nutrition monitoring but recently has been improving. In the past, NFCS and NHANES data were generally considered preliminary until the next survey. Hispanic-HANES data (collected from 1982 to 1984) has only recently been made available. Reports and data tapes from the 1985 and 1986 CSFII (small, non-national samples) were released within 6 months after data collection (7). Efforts to improve data release must continue for timely and accurate formulation and evaluation of food and nutrition policy and programs.

Interpretation of monitoring data: The first report of the Joint Nutrition Monitoring Evaluation Committee, due to Congress in November 1984 (according to the 1981 JIPCNNMS), was not released until July, 1986 (8). To remain on schedule with the original JIPCNNMS, another report was due to Congress in 1987. This deadline has not been met since we are now well into 1988. However, USDA and DHHS have contracted with the Federation of American Societies for Experimental Biology (FASEB) to create an Ad Hoc Expert Panel on Nutrition Monitoring to prepare the second report due to Congress (9).

Expanded usefulness of monitoring data: The usefulness of monitoring data is dependent upon its application to the general and specific populations in a timely manner. The availability of technical assistance and training for non-federal users, although improved, needs further expansion in data analysis and utilization; and, the development of a central focus for dissemination of data. Current food and nutrition policy for the American public is principally formulated with 1977 to 1978 NFCS and 1975 to 1980 NHANES II data. The 1984 President's Task Force on Food Assistance stated that food and nutrition investigations currently must use data that become available only after the urgency which prompted their need has passed (10).

Two areas not addressed in the Plan but needed are the stimulation of research to make monitoring techniques more effective; and the formation of an external scientific body to transmit the monitoring needs of non-federal users. With the ever changing diet and health behavior of the public; food, nutrition, and health professionals require a nutrition monitoring system that provides timely, coordinated, and useful data and technical assistance for programming and policy formulation.

Cost of National Nutrition Monitoring

The cost of S. 1081 will depend on the priorities selected and the level of effort each agency determines that it will accept in any fiscal year. However, the bill clearly states that nothing in the title is intended to authorize the appropriation or require the expenditure of any funds in excess of the amount of funds that would be authorized or expended for the same purposes in the absence of the coordinated program. Moreover, improved coordination of monitoring efforts should make more effective use of federal expenditures and thereby result in cost savings. Also, S. 1081 will provide policy-makers with a rational basis for allocating scarce resources.

Additionally, the bill calls for the use of cost-recovery management techniques and imposes charges and fees for publications of the coordinated program to supplement the resources provided by the federal government. Finally, there is the long-term cost savings that would result from a sound nutrition monitoring system. More timely and better coordinated data collection and analysis would be invaluable in carrying out effective nutrition education and intervention programs. The improved health that would result from these programs would save money both in the government and in the private sector (11).

Needs of state and local governments:

Although the bill establishes a central federal focus for coordinating, managing and directing national monitoring activities, it does a great deal, as well, to get states and localities more into the nutrition monitoring picture. The bill also directs the Secretaries and the Board to include in their program scientific and technical assistance to state and local governments in obtaining dietary and nutritional status data.

The current NNMS falls short of providing information on high risk groups: hungry, homeless, elderly, pregnant women and children. The Operational Plan for the National Nutrition Monitoring System which does show some improvement, does reveal major gaps. Nutritional status data on hungry and homeless persons is conspicuously absent from the current system.

The Centers for Disease Control Pregnancy and Pediatric Nutrition Surveillance Systems, for example, are only conducted in 14 and 34 states, respectively. Public Health Nutritionists and Public Health Administrators in state government have stated that it is becoming more difficult to initiate these Systems in states because fewer funds are being committed to nutrition. The CDC surveillance systems, although very useful, provide data that primarily represents participants (80%) in the Special Supplemental Foods Program for Women, Infants and Children (WIC). Therefore, this data does not reflect the nutritional status of non-WIC participants (12).

The elderly population in American is growing rapidly. It is critical that nutritional status data is available to nutrition and dietetic professionals to develop educational programs and provide dietary guidance. NHANES only samples individuals up to age 75. While there is a large body of information on technological advances in medicine to increase lifespan, current monitoring systems do not provide nutritional status data on this increasingly important segment of the population.

Scientific research and development; improving technology transfer

For the purpose of developing better and less costly methods of data collection, the bill .requires the Secretaries of USDA and DHHS to coordinate the conduct of such scientific research necessary to support the NNMS. With all the technological innovation we hear about every day in the areas of space launches, artificial hearts, etc. surely there are less invasive, more precise and less costly methods that could be developed to determine dietary intake and nutritional status. We think this special grants program could and should encourage this kind of research.

As stated at the March 2nd hearing on nutrition in health and disease, there was a unanimous consensus from Administration representatives and scientific experts that more funds need to be appropriated for basic nutrition research. Research related to nutrition monitoring should be a component of basic nutrition research.

Title II: National Nutrition Monitoring Advisory Council

ADA supports the formation of the Advisory Council because currently there is little outside input going to the agencies. The Advisory Council as provided in the legislation will provide an objective perspective to the system that does not exist with representation only from federal agencies.

Title III: Dietary Guidance

Consumer demand is one factor that drives food production. Consumer demand for nutrition information should also drive nutrition surveys to release information that is timely, useful, and understandable by users and other interested parties. The need for timely data from the NNMS is directly linked to the need to revise federal dietary recommendations.

Closing

I thank the Committee on Governmental Affairs for the opportunity to express the views of The American Dietetic Association on the National Nutrition Monitoring and Related Research Act of 1987. The Act takes the resources currently used for nutrition monitoring and directs that they be used in a coordinated and more cost-effective manner. Without a comprehensive nutrition monitoring system, we will continue to be faced with the same problems in determining the nutritional status of both high-risk and healthy Americans. I hope that S. 1081 will be promptly reported out of the Committee on Governmental Affairs and enacted into law this year.

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(10) Report of the President's Task Force on Food Assistance. Washington: President's Task Force on Food Assistance (Unpublished report), 1984.

(11) Shipley-Moses, E. and Dodds, J.: Nutrition Surveillance and Monitoring. J Nutr Ed 19: 125, 1987.

(12) Conversation with Agnes W. Hinton, Member of the USDA WIC Advisiory Committee. March, 1988.

FIGURE 1

ORGANIZATIONS IN SUPPORT OF NATIONAL NUTRITION MONITORING

The American Academy of Pediatrics
The American Association of Retired Persons
The American Baptist Churches USA
The American College of Preventive Medicine
The American Dietetic Association
The American Heart Association
The American Home Economics Association
The American Institute of Nutrition
The American Medical Students Association
The American Nurses Association
The American Public Health Association
The American School Food Service Association
The American Society for Clinical Nutrition
The Association of State and Territorial Health Officers
The Association of Schools of Public Health
The Association of Teachers of Preventive Medicine
Bread for the World
Center on Budget and Policy Priorities
Coalition on Block Grants and Human Needs
Food Research and Action Center
Lutheran Office for Government Affairs
Mennonite Central Committee
National Association for WIC Directors
National Consumers League
National Council of La Raza
National Farmers Union
National Osteoporosis Foundation
National PTA
National Perinatal Association
National Student Campaign Against Hunger
Public Voice for Food and Health Policy
Service Employees International Union
Society for Nutrition Education
United States Conference of Local Health Officers
United Fresh Fruit and Vegetable Association
World Hunger Education Service
World Hunger Year

3/1/88

TABLE 1. Joint Implementation Plan for National Nutrition Monitoring System, 1981 Calendar of Events

Year	Month	Event	Status
1976-80		National Health and Nutrition Examination Survey II (NHANES II) conducted on a representative sample of the civilian, noninstitutionalized U.S. population, ages six months to 74 years, comprising over 20,000 persons.	Data collection completed in 1980. Data analysis completed and all data released by 1984.
1977-78		Nationwide Food Consumption Survey included a probability sample of the 48 conterminous States, samples of Alaska, Hawaii and Puerto Rico, and special samples of elderly and low-income households.	Data collection completed in 1978. Data analysis essentially completed.
1981	(October)	Appointment of NFCS-NHANES Coordination Committee by ASFCS-USDA and ASH-DHHS, from DHHS, USDA, other Federal agencies concerned with monitoring, and users of survey data outside the Federal Government. The committee will recommend survey designs for NFCS and NHANES that are coordinated to the maximal extent possible.	Coordination Committee set up in 1981. Committee members deferred to statisticians to report on feasibility of combining/coordinating work of surveys; report completed in September 1982.
1981	(November)	Appointment of a DHHS-USDA Joint Nutrition Monitoring Evaluation Committee (JNMEC) by ASH-DHHS and ASFCS-USDA.	Committee appointed October 1983, and held first meeting December 1983; delayed 2 years due to charter preparation.
1981-82		Study of longitudinal measures of individual intakes to test alternative methods for collecting dietary intakes of individuals at intervals up to a year. To be conducted by HNIS, USDA.	Completed
1982	(September)	NFCS-NHANES Coordination Committee to forward completed report and recommendations to ASFCS-USDA and ASH-DHHS.	Letters from separate agencies to Congress on progress in system implementation; no formal report prepared.
1982		Longitudinal study of the effects of infant feeding practices on morbidity and growth in the first year of life. To be conducted by HNIS in consultation with FNS of USDA and coordinated with appropriate units of DHHS.	Cancelled by OMB which declared it unnecessary.

TABLE 1. (continued)

Year	Month	Event	Status
1982	(January and July)	Monitoring Data Users Conferences to be sponsored by DHHS and USDA. Participants to include data users in Government, academia and industry.	Users meeting and subsequent conference were held respectively in July and December 1983.
1982-84		Hispanic Health and Nutrition Examination Survey (HHANES) to be undertaken; it is anticipated that 12,000-15,000 Hispanics in selected locations will be examined over 24-30 month period beginning July 1982.	Data collection completed December 1984. Data analysis completed and released in spring 1988.
1983-84		Field test best methods for collecting dietary data on individuals. HNIS, USDA.	Completed
1983-84		Field test best methods for determining household food losses. HNIS, USDA.	Completed
1984	(November)	Completion and forwarding to Congress of first Joint DHHS-USDA report on Federal nutrition monitoring activities.	Promised to Congress for November 1985, but was actually sent in July 1986.
1984-85		Longitudinal individual intake survey, replacing individual portion of decennial NFCS, USDA. To be conducted by HNIS.	First continuing survey for individual intakes conducted in 1985.
1984-85		To resolve methodologic problems, DHHS and USDA will conduct a joint pilot study in two locations to test maximal coordination of NHANES and and NFCS.	Joint pilot study on methods never implemented.
1987		Conduct of first coordinated NFCS-NHANES survey.	NFCS begun in 1987. Failure to request funds in 1985 budget for preliminary work on HANES III leads to delay until 1988 of HANES III implementation.

Statement of Mr Larry J. Gordon
Senate Government Affairs Committee
National Nutrition Monitoring and Related Research
22 March 1988, Washington, D.C.

Mr Chairman, members of the Committee and Associates: On behalf of the Association of State and Territorial Public Health Nutrition Directors, an organization of Nutrition professionals representing the health agencies of the 56 states, territories, districts and commonwealths, I thank you for the opportunity to speak in support of legislation that will, for the first time provide this country with a coordinated, integrated and timely system for Nutrition Monitoring.

The need for National Nutrition Monitoring legislation has only intensified in the 4 years since we first testified in favor of a bill in the House of Representatives. While we do recognize and appreciate the efforts of the Department of Health and Human Services (DHHS) and the U.S. Department of Agriculture (USDA) to work with one another and with those of us in State Departments of Health, these efforts do not preclude the need for this legislation. Even greater cooperation and coordination is essential and even the progress that has been made could easily be eradicated by a change in administration or key personnel in lead agencies.

Today I will describe some of the responsibilities, problems and needs of State and Local Health Departments in regard to food and nutrition data that will be supported by this legislation. I will also address some of the specific provisions of the bill.

We in the States have an increased responsibility for planning programs and services to meet the needs of our citizens, and very little information on which to base those decisions. Health Departments are charged with the responsibility for promoting and protecting the health of the public including the control of communicable disease, control of chemical contamination, and of alleviating chronic health and social problems. The expectations of state and local health departments have also been expanded during this current administration as the "New Federalism" has shifted the emphasis for planning and priority setting to the states.

There has been a steady increase in the competition for limited state and federal resources, and a need to allocate those resources in an equitable manner. Timely, complete and reliable data is essential to our task of developing policies and programs to meet the changing health needs of our citizens. Over the past several years we have been faced with making decisions about the magnitude and severity of nutritional problems within our jurisdictions without good nutritional data on which to base decisions. Massachusettes, New York and Texas have been able to conduct limited state nutrition surveys to determine specific nutrition problems, and have used the data to secure state funding to expand their WIC programs. With limited resources most states cannot undertake comprehensive surveys and must continue to rely on the federal government for leadership in the collection & interpretation of nutrition status data.

We need reliable, standardized data that is readily accessible to the states. The core of the current National Nutrition Monitoring "system" consists of the National Health and Nutrition Examination Survey (HANES) and National Food Consumption Survey (NFCS), with, depending on who is counting, up to 30 other data sources. The majority of these data sets exists independently of one another. Within this mountain of data, there is some overlap, some gaps, many inconsistencies, and virtually no way to put any combination together to get a complete picture of the dietary habits and nutritional status of the American public. We in the states need a system that coordinates the studies so that the results can be used to portray an accurate picture of our citizens and identify those with problems who are in need of services. With such data we can develop programs that target specific problems.

We need more specific information about groups who are most vulnerable to nutrition problems. The current sampling methods used for most of these studies results in undersampling those most likely to have nutrition problems: the very young, the elderly, the poor, especially the homeless, and certain minority groups. While we recognize the importance of establishing "norms" we must also advocate for a system that documents nutritional problems in our country so that we can target resources appropriately. We applaud the inclusion in this legislation of the requirement to develop a plan for the continuous monitoring of these high risk groups.

I cannot overstate the importance of timely information. When the 1990 Nutrition Objectives were published in 1980, HANES I data, collected from 1971-74, was used to set the baseline levels, when data from HANES II, 1976-80, became available, it was clear that significant changes had already occurred in several parameters (average cholesterol levels had decreased and there had been a 3-4 % increase in obesity). We are now writing Objectives for the Year 2000, and HANES III has not even started. Once more, we are writing objectives with an inadequate data base. The same thing occurs when we try to set goals at the state level, and as I'm sure you all understand, it is difficult to convince legislators that they should fund programs to meet needs that we cannot accurately describe.

We must know trends in nutritional status and dietary habits. The population of the United States represents the proverbial "moving target". The new USDA "Continuing Food Consumption Survey" has addressed this need, but we need the same type of information on health status, food program utilization and composition of the food supply. This might have allowed us to predict the increase in use of emergency food programs over the past several years, and to have instituted programs to alleviate inadequate access to food problems earlier.

There is a critical need for new, cost effective methods for monitoring trends in food consumption and nutritional status. There has been little work by either DHHS or USDA to develop shorter, cheaper methods that we could then use in our states to supplement the national studies. The first national food consumption survey was done in the 30's and both USDA and DHHS have participated in numerous surveys ever since. Yet even with the telephone and microcomputers available, we still do not have easy to use, accurate, economical methods for determining what people eat. The State of California recently developed a telephone survey to determine eating habits. It cost $50,000 to develop, but they do not have the evidence they need to be assured of the validity of their work.

Perhaps our greatest need in the states is for technical assistance, the sharing of the knowledge and expertise of those who work on these federal projects with our staffs. At the federal level there are the resources to develop new methods and equipment and to teach us new ways of looking at our work. The demand for statistical support is great, and our resources are limited. Few of us can afford the luxury of statisticians who are experts in any one field, such as nutrition.

Over the years the federal agencies have become much more open and have shared vast amounts of data with us, but we need more than copies of computer tapes and printed reports. We would like assistance in interpreting and using the data, in setting up local data bases, and supplementing the national data. The nutrition staff at the Centers for Disease Control have been particularly helpful in assisting us to set up various surveillance projects including Pediatric Surveillance, Pregnancy Surveillance, and the Behavioral Risk Factor Surveillance survey. This type of assistance from NCHS, USDA and the other federal agencies is also needed. The potential for sharing resources and data between the states and federal government is extensive, the plan required by this legislation would give a great deal of impetus to this sharing.

Finally, as users of nutrition data, we need to participate in the planning of the various studies and surveys. We would like to have the opportunity to propose the questions that we believe need to be answered in order to plan effective programs. We would like to participate in the setting of priorities and making of decisions about how surveys are conducted, the type of data to be gathered, and most critically, how that information will be distributed. At the present time we are unaware of any plan for the distribution of the millions of dollars worth of data that will be collected during HANES III. If the practice used in the past is followed, data tapes will be made available to academic institutions for analysis. Reports will come years later as masters theses and doctoral dissertations are finally completed. Vast amounts of the data may never be distributed if no one is particularly interested in reviewing and publishing it.

Even without additional funding, this proposed legislation has a several of features that make it especially important to State Health Departments. First is the centralization of Nutrition Monitoring activity with the requirement for a written plan and regular reports to congress; the provision of technical support to the states; inclusion of a program of grants to states; the requirement for a budget for nutrition monitoring activity; and finally, the requirement for an advisory committee to the program.

We believe that the coordination of nutrition monitoring activity at the federal level is extremely important in solving some of the problems we have experienced using data from several different sources. At a minimum this activity should make it easier to understand how and when to use each of these surveys. We expect that with a central plan there will be a focal point or clearing house available to advise us on data items available and their use. We also expect that this plan will emphasize gaps in the current network of services such as the impact of the various food assistance programs, and the role of attitudes, motivation and skill in determining food habits. A written plan will let us know what we can count on. It will help immensely in knowing what studies are underway and when we can expect reports.

At the present time, nutrition monitoring is a discretionary item in each agency budget. This makes it an easy target in times of budgetary constraint. Making it a line item will clarify to congress and the public, just how much is allocated, and what value we get for our money. Again, it will provide some assurance that data we are counting on will be forthcoming.

We especially appreciate the inclusion of the National Nutrition Monitoring Advisory Council in this legislation. It provides the first formal opportunity for users of nutrition monitoring data to provide input and guidance to the federal agencies about their needs. We would like to suggest one minor change in the composition of the committee. That is, to assure the participation of state and local health departments by specifying employees of health agencies rather than simply "government employees". Because of the mandate for health departments to promote the health of the public, employees of these agencies are more likely to have knowledge and experience with surveys, their uses and their problems than employees in other departments such as education or welfare. It is vital that the "end users" in public health be included as well as the academicians who are typically viewed as the users of this data.

In further support of this legislation I would like to cite the findings and recommendations of four study groups. The first, the Presidents Task Force on Food Assistance in 1984, upon discovering there was no data to assess whether or not nutritional status in this country had worsened, recommended:

1. Improve the major surveys;
2. Expand uniform state reporting;
3. Develop new measurement tools; and,
4. Conduct smaller more frequent surveys to give more current information.

The second, the progress report of the Joint Monitoring Evaluation Committee entitled "Nutrition Monitoring in the United States" and issued jointly by USDA and DHHS in July 1986 made 14 recommendations in 4 categories:

1. Improve information exchange between data users and gatherers;
2. Increase the use of the data collected under the national nutrition monitoring system;
3. Improve the methods and techniques for gathering information and assessing nutritional status; and,
4. Increase resources for the National Nutrition Monitoring System.

The Federation of American Societies for Experimental Biology, in their 1985 midcourse review of progress toward the National Nutrition Objectives for 1990 found little evidence of progress and concluded that there was inadequate data to monitor or determine whether progress was being made. The National Agricultural Research and Extension Users Advisory Board in their 1985 report to the president and congress also called for an improved National Nutrition Monitoring System.

There is little evidence of progress in solving any of these problems or meeting these recommendations. We continue to believe that this legislation is needed, and needed now, in order to get nutrition monitoring on track and to have a true system in this country, rather than a collection of activities carried out by several agencies as we do now. I would like to again emphasize that we in the states do not expect the federal government to act alone. We stand willing to work with the administration in planning and developing a National Nutrition Monitoring System, helping to collect the data and to use and publicize the results.

In summary, the discussion of the need for nutrition monitoring began in the early 1970's, and has been discussed in both houses of congress almost every year since. The time for purposeful action is now. The American public is concerned both about nutrition problems that affect the nation's health and about limited resources available to intervene to counter those problems, Federals, State and Local Health Agencies need timely information to make decisions. To date, the mechanisms designed to meet these needs have not produced the desired results. Nothing less than the passage of the National Nutrition Monitoring and Related Research Act in 1988 will provide the national structure needed to achieve optimal nutritional health from our investment.

Thank you for the opportunity to address this committee today, I am prepared to answer questions as you wish.

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Emergency Food
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TESTIMONY
on
S. 1081

The Nutrition Monitoring and Related Research Act

Presented to:

Committee on Governmental Affairs
U.S. Senate

Presented by:

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Food Program Advocate

March 22, 1988

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HUNGER SERVICES NETWORK

Hunger Services Network is a private, non-profit collection of organizations and individuals concerned about the causes and effects of hunger. Established as Hunger Action Coalition in 1975, the organization works on all levels to alleviate hunger in Allegheny County, Pennsylvania.

Hunger Services Network maintains several programs which work together toward this end. We operate an emergency food assistance hotline, which links households in crisis situations with pantries whose volunteers provide the clients with a three to five days supply of food. From 1979 through 1987, we assisted 45,048 households (128,658 people) in this manner. We also work to establish new pantries and offer technical and networking assistance to the pantries. Our pantry network has grown from a handful of members in 1979 to its present level of more than 130.

Through our food program counseling service, we pre-screen clients for food stamps and other food assistance programs and encourage them to apply for the programs for which they are eligible. We cooperate with local offices of the Pennsylvania Department of Public Welfare to resolve problems when eligible clients do not receive their food stamps as a result of errors, red tape, etc. Since 1982, we have screened more than 7300 households for food stamps and helped to resolve problems for 344 food stamp recipients.

Hunger Services also maintains a library, a speakers' bureau, and extensive files of articles, studies, reports, and other publications on hunger and poverty issues in order to keep abreast of developments and foster awareness of the hunger problem among the public. The agency analyzes and comments on proposed and final legislation and regulations and monitors public budget and policy issues pertaining to hunger. Since 1985, we have submitted fifteen sets of comments on proposed and interim rules which appeared in the Federal Register. (See Attachment 1)

S. 1081

S. 1081, the Nutrition Monitoring and Related Research Act is, in the long run, the most important piece of anti-hunger legislation to come before Congress in many years. Among other things, it will establish a system to count the number of hungry people in the United States on a regular basis. This data will provide anti-hunger advocates with much-needed evidence to support our work for improvements in federal food assistance programs. The information obtained from the monitoring will also provide a basis for establishing a comprehensive federal anti-hunger policy. At the moment, there is no such policy.

There have been many studies documenting the extent of hunger in the past eight years. Most have been conducted by private organizations or local governments. In 1985, Hunger Action Coalition commissioned a study by the School of Urban and Public Affairs of Carnegie Mellon University.[1] The most recent report by Harvard University's Physician Task Force on Hunger in America[2] lists 32 national and 43 state/local studies from 28 states. (See Attachment 2) Many other studies were also conducted but were not included in that list. The findings of the studies overwhelmingly agreed that hunger is present and growing, and the benefits of federal programs have not kept pace with inflation. In fact, drastic cuts in food assistance programs have directly harmed millions of Americans.

It is difficult to expound on the previous statement without quoting every study and statistic at our disposal. That alone is evidence of the extent of hunger in America. However, we believe that the proliferation of agencies responding to the hunger crisis and the increased demand for the services offered by those agencies speak for themselves. In 1979 there were less than 20 food banks in the United States. There are now more than 200.[3] We can't even count the number of pantries, soup kitchens, and other agencies. Hunger Action Coalition's Emergency Food Assistance program served 472 households in 1979. In 1983, (after the 1981 Omnibus Budget Reconciliation Act food program cuts had taken their toll) we served 6041 households. In 1980, when 29.3 million Americans lived in poverty, 19.8 million people received food stamps (68%). But in 1983, with 35.3 million people in poverty, only 21.6 million people participated in the food stamp program (61%). Our experience with our clients is representative of national statistics. Sixty four percent (64%) of our emergency food assistance clients already receive food stamps, but still need our help to feed their families. Fifteen percent (15%) of our clients have no income whatsoever. Most of our clients' food stamps are gone by the third week of the month. (See Attachments 3, 4, and 5)

Despite the overwhelming evidence from numerous studies and the expert opinion of those on the front lines, many people still refuse to admit that a problem exists. Time after time, when advocating for particular programs, legislation, or regulations, we are told about a mythical "safety net" or condescendingly "informed" that those who claim to be hungry are really too lazy to work. (See Attachment 6)

In August, 1983, President Reagan claimed to be "perplexed" by reports of hunger in the United States. After the public outrage caused when then-advisor Edwin Meese claimed that people only go to soup kitchens because the food is reee, the President appointed a Task Force on Food Assistance. In its report (issued January, 1984)[4] the Task Force recommended that". . . the federal government take several steps designed to improve information on the nutritional status of Americans." The Administration has yet to follow the advice of its own Task Force.

While life is much too complicated to allow anyone to become an expert on every subject, most people are well versed on at least one topic. Anti-hunger advocates work with hunger, poverty, and inadequate federal programs every day. Many of us have spent years studying regulations, helping clients through the bureaucratic mazes, and packing bags of groceries. Some of us have been, or still are, poor and hungry. However, when speaking of those issues, we are routinely disputed, avoided, and ignored. Many people just don't want to know the truth.

Without hard data acceptable to its members, it is almost impossible to convince Congress to approve vital changes in food assistance programs. Some changes which we would like to see include: increasing food stamp benefits and loosening eligibility requirements, increasing reimbursement rates for the child and elderly nutrition programs, increasing funding for the WIC Program so that all eligible families can participate, and funding comprehensive outreach campaigns for all food assistance programs. How likely is it that those changes will be implemented when our expertise in the matter is always questioned? With data provided by nutrition monitoring, the need for improvements will be indisputable and will save a great deal of time and effort for all involved. Without the data, we will continue to run around in circles just to stay in the same place.

As mentioned above, [illegible] maintains a speakers bureau to educate the public about the causes and effects of, and solutions to, hunger. The most frequently asked questions are: How many people in the United States are hungry? Who are they? Where are they? and Why are they hungry? A nutrition monitoring system will answer these questions. While the private and local studies which already exist are generally accurate and reliable, they are relatively minor and sporadic. Only a comprehensive system can provide the data that we need.

Title I, Section 103 (a) (1) of S. 1081 provides for the use of the nutrition monitoring data as a base for establishing a national food and hunger policy. At present, the United States has no such policy. In September, 1976, both houses of Congress adopted a Right to Food Resolution. (See Attachment 7) Included in that resolution was the statement: ". . . in the United States, we should seek to improve food assistance programs for all those who are in need, to ensure that all eligible recipients have the opportunity to receive a nutritionally adequate diet. . . ." After more than eleven years, the United States has yet to establish a method of determining how many Americans are in need to fulfill the conditions of that resolution. Granted, several valiant legislative efforts to feed the hungry have been made -- some of them quite commendable -- but those efforts have been sporadic and the level of commitment variable. During the past twenty years, the United States has been following a hit or miss practice of providing for its hungry. That practice has failed.

The United States uses food assistance programs as its traditional means of dealing with hunger. While millions of Americans have benefited immensely, those programs are still grossly inadequate because of the lack of a comprehensive national anti-hunger policy. The Nutrition Monitoring and Related Research Act will serve as a prelude to an efficient, consistent, and comprehensive policy. With such hard data at hand, policy-makers would be hard-pressed to avoid the issue.

The Act would provide data to states and municipalities to use in determining their own hunger policies. The fact that national data exists does not necessarily mean that all responses to that data must be on a national level. The data will also be useful for private organizations to design programs to fill the gaps in the public programs.

Since 1983, Pennsylvania has provided funds for food banks through its State Food Purchase Program. In fiscal year 1986 - 1987, the state General Assembly appropriated $8 million for the program. In fiscal year 1987 - 1988 the funds were cut to $7 million. The legislative leadership refused the requests of anti-hunger advocates to restore the $1 million and add another $2 million because they insisted that hunger was not a problem since the official (and inaccurate) unemployment rate had decreased. They refused to accept the findings of a study by the Pennsylvania Association of Regional Food Banks (See Attachment 5), volumes of statistics, and the expert opinion of Pennsylvania's advocates for the hungry that hunger is increasing in the state. While political maneuvering has since brought progress on the supplemental appropriation bill (Pa. H.B. 1715), the discussions, arguments, and maneuvering involved could have been avoided if nutrition monitoring information had been available.

A careful reading of the history of food program legislation during the past fifty years shows and ebb and flow of concern about the problem and commitment to finding solutions. While that is all very interesting politically and historically, it is personally devastating to those who must suffer because of such instability. Did you know that the fact that various members of Congress can't work out their differences directly affects the ability of parents to feed their children? A national anti-hunger policy based on verifiable data would not be subject to those whims and America's hungry would finally get some real help.

A common definition of hunger is "pain or uneasiness caused by want of food". There are clinical definitions of "undernutrition" and "malnutrition" as well. Through the upsurge of hunger in the 1980's, we have struggled to provide our clients with a sufficient quantity of food, as have our colleagues. When distributing food, we do our best to provide good quality and a nutritionally balanced package of groceries. We often fail. Of the 128,658 people we have served since 1979, we have no doubt that many of them are existing on nutritionally inadequate diets, even though we may have temporarily succeeded in alleviating their hunger pains.

Even the United States Department of Agriculture has stated that the food stamp program does not provide adequate nutrition for households trying to make do on food stamps alone. (See Attachment 8) There are approximately 18.5 million Americans receiving food stamps now. Most of them try to depend on food stamps as their sole means of purchasing food. If 75% (13,875,000 people) rely on food stamps to purchase all of their food, and less than 10% (1,387,500 people) receive adequate diets, then approximately 12,487,500 food stamp recipients do not receive proper nutrition. And the food stamp program, as restrictive at it is, only reaches about half of those who are eligible to participate.[5]

Even those who are not "hungry" by the common definition are often at nutritional risk. Since we are not qualified to comment on the technical and scientific aspects of the bill, we will leave that to those who are. We ask you to respect their expertise.

CONCLUSION

The hardest part of my job is telling desperate, needy people that they do not qualify for the food stamp program because of the restrictive eligibility requirements. I tell them that I personally disagree with many of the regulations, but that the rules are made by Congress and must be followed. Then I suggest that they write to their representatives if they want to see those rules changed.

It is incredible that any nation would refuse to find out how many of its citizens are suffering from hunger and malnutrition in order to design and implement a plan to alleviate that suffering. This is your opportunity to correct a serious deficiency in national domestic policy.

Nutrition monitoring bills passed the House of Representatives in the 98th and 99th Congresses. The Senate has yet to approve such a bill. Please send S. 1081 to the full Senate with your recommendation for approval. Otherwise, perhaps you can tell my clients that they can't get help because those in power do not believe that their problem is real.

FOOTNOTES

1. "Hunger in Allegheny County: A Study of the Food Assistance System and the Hunger Problem"; School of Urban and Public Affairs, Carnegie-Mellon University and Resource Management Department, United Way of Allegheny County; May, 1986.

2. "Hunger Reaches Blue Collar America: An Unbalanced Recovery in a Service Economy"; Physician Task Force on Hunger in America, Harvard School of Public Health; October, 1987.

3. Source: Second Harvest, the national network of food banks.

4. Draft of Final Report; The President's Task Force on Food Assistance; January 9, 1984.

5. These figures are estimates. Without nutrition monitoring data, it is impossible to provide precise statistics.

ATTACHMENT 1

Hunger Services Network

4907 Penn Avenue
Pittsburgh, PA 15224-1608
(412) 361-2501

(formerly a program
of Hunger Action Coalition)

Emergency Food
(412) 361-3321

Food Program Counseling
(412) 361-3286

HUNGER SERVICES NETWORK was a program of Hunger Action Coalition until January 1, 1987. Hunger Action Coalition was founded in 1975 and incorporated as a non-profit, charitable organization in 1979.

Hunger Services Network is a collection of organizations and individuals concerned about the causes and effects of hunger and poverty. We serve Allegheny County, Pennsylvania.

A 1977 study by Hunger Action Coalition and the University of Pittsburgh revealed that 48,000 people in our county went hungry at least once in 1976. A 1985 study conducted by Carnegie-Mellon University for Hunger Action Coalition douments a drastic increase in the incidence of hunger and in the demand for emergency services and solutions. The study, published in 1986 by the United Way of Southwestern Pennsylvania, describes reasons for the demand and suggests both short-term and long-term strategies to meet that need. Because of the decline in local economic conditions and cuts in government programs, Hunger Services Network estimates that over 100,000 Allegheny County residents went hungry in 1986.

The following is a description of our services.

EMERGENCY FOOD ASSISTANCE NETWORK

Our emergency food assistance hotline links households, who are completely without food, to pantries whose volunteers provide the clients with a three to five day supply of food. This service assisted 108,312 people in 28,430 households from 1979 through 1986.

Our office provides technical assistance to new and existing pantries, as well as financial assistance when possible. There are currently over 150 pantries in our network. The staff also coordinates our Pantry Adoption Program.

FOOD PROGRAM COUNSELING SERVICE

Our food program counselors pre-screen clients for food stamps and other food assistance programs, encourage them to apply for the programs for which they are eligible, and furnish information on application procedures. Since 1982, we have screened 6705 households for food stamp eligibility, and found that 3927 (59%) were eligible. We cooperate with local offices of the Pennsylvania Department of Public Welfare to resolve problems when eligible clients do not receive their food stamps as a result of errors, red tape, etc. We have helped more than 300 households with problems of this nature.

The staff also trains groups to do pre-screening and works in the community to develop new resources against local hunger.

COMMUNITY EDUCATION AND INFORMATION

Hunger Services Network maintains a library, a speakers' bureau, and extensive files of articles, studies, and reports on hunger and poverty issues in order to keep abreast of developments and foster awareness of the hunger problem among the public.

FOOD PROGRAM ADVOCACY

Our staff is knowledgable about eligibility requirements for all food assistance programs, and works to keep up with changes in those regulations. We analyze and comment on proposed and final legislation and regulations and monitor public budget and policy issues. We work with government agencies to ensure that the regulations are enforced.

DATA COLLECTION

The Network's Data Specialist maintains a comprehensive data collection system about the characteristics of hungry people in our area. This system is used to track changes in the picture of poverty, inform the public, and spur the community to action.

WE NEED YOU !

If you want to help us in our fight against hunger, PLEASE JOIN US!

We have seen hunger in every neighborhood of Allegheny County, including yours.

You can become a member of HUNGER SERVICES NETWORK for an annual contribution of $25 or more.

We also need VOLUNTEERS. Whatever your talents, interests, or time available, we need you. PLEASE HELP US!

EMERGENCY FOOD ASSISTANCE HOTLINE *Weekdays, 10 a.m. to 3 p.m.*	361-3321
FOOD PROGRAM COUNSELING *Weekdays, 10 a.m. to 3 p.m.*	361-3286
ALL OTHER CALLS *Weekdays, 9 a.m. to 5 p.m.*	361-2501

Attachment 2

National/Regional Domestic Hunger Studies

(1982-1987)

Study/Survey	Date
1. United States Conference of Mayors	10/82
2. United Church of Christ	1/83
3. U.S. Department of Agriculture, "Case Studies of Emergency Food Programs"	5/83
4. Center on Budget and Policy Priorities, "Soup Lines and Food Baskets"	5/83
5. United States Conference of Mayors, "Hunger in American Cities"	6/83
6. Salvation Army of America, report	6/83
7. General Accounting Office, "Public and Private Efforts to Feed America's Poor"	6/83
8. National Council of Churches, Domestic Work Group on Hunger and Poverty	8/83
9. Bread for the World, "Hunger Watch"	9/83
10. United States Conference of Mayors, "Responses to Urban Hunger"	10/83
11. Food Research and Action Center, "Still Hungry"	11/83
12. Harvard School of Public Health, "American Hunger Crisis"	2/84
13. Save the Children/American Can Company, "Hard Choices"	9/84
14. United States Conference of Mayors, "The Urban Poor and Economic Recovery"	9/84
15. Food Research and Action Center, "Bitter Harvest"	11/84

16. Harvard School of Public Health, "Hunger in America: The Growing Epidemic"	2/85
17. Southern Regional Council, "Public Assistance and Poverty"	3/85
18. United States Conference of Mayors, "The Status of Hunger in American Cities"	4/85
19. Bread for the World, "Unfed America '85"	10/85
20. Food Research and Action Center, "Bitter Harvest, II"	12/85
21. United States Conference of Mayors, "Growth of Hunger, Homelessness and Poverty in Cities"	1/86
22. Public Voice, "Rising Poverty and Declining Health: Nutritional Status of the Rural Poor"	2/86
23. Harvard School of Public Health, "Increasing Hunger, Declining Help in the Food Stamp Program"	5/86
24. General Accounting Office, "Food Stamp Program: Restoration of Improperly Denied Benefits"	10/86
25. House Select Committee on Hunger	12/86
26. United States Conference of Mayors, "Continued Growth of Hunger, Homelessness and Poverty"	12/86
27. Salvation Army of America, food data update	1/87
28. House Select Committee on Hunger, "Hunger Among the Homeless: Survey of Shelters and Food Stamps"	3/87
29. Food Research and Action Center, "Miles to Go: Barriers to Federal Food Programs"	6/87
30. National Student Campaign Against Hunger, "Portrait of America's Hungry"	7/87
31. Public Voice, "Profiles of Rural Poverty, Barriers to the Food Stamp Program"	7/87
32. Harvard School of Public Health, "Hunger Reaches Blue Collar America: An Unbalanced Recovery in a Service Economy"	10/87

State/Local Domestic Hunger Studies

(1981-1987)

Study/Survey	Date
1. FLORIDA- Florida Impact, "Hunger in the Community"	9/81
2. OKLAHOMA- Oklahoma Council of Churches, "Hunger and Malnutrition in Oklahoma"	12/82
3. NEW JERSEY- Rutgers University School of Social Work	1982
4. MICHIGAN- Michigan Nutrition Commission, "Impact of Unemployment on Health"	1/83
5. CALIFORNIA- Interfaith Hunger Coalition of Southern California	4/83
6. NEW YORK- New York State Hunger Watch	10/83
7. COLORADO- Boulder Community Action, "Food Needs in Boulder County"	12/83
8. ARIZONA- Arizona Hunger Action Center, "Tucson Hunger Survey"	12/83
9. TEXAS- Senate Interim Committee on Hunger	1984
10. DELAWARE- Delaware Food Conservers, "Delaware Hunger Watch"	3/84
11. RHODE ISLAND- Community Food Bank, "Hunger in Rhode Island"	5/84
12. ILLINOIS- Legislative Advisory Committee on Public Aid	5/84
13. KENTUCKY- Kentucky Hunger Task Force	7/84
14. LOUISIANA- Nutrition Task Force, "Hunger in New Orleans"	8/84
15. OHIO- Ohio Hunger Task Force	9/84
16. MARYLAND- Governor's Task Force on Food and Nutrition	11/84

17.	VIRGINIA- Virginia Forum on Hunger	11/84
18.	WISCONSIN- Wisconsin Nutrition Project	12/84
19.	CALIFORNIA- N. California Anti-Hunger Coalition "Emergency Food Assistance in Three Counties"	12/85
20.	MASSACHUSETTS- Project Bread Hunger Hotline	1/85
21.	OKLAHOMA- Oklahoma IMPACT, "Poverty and Health in Oklahoma: A Closer Look"	1/85
22.	FLORIDA- Dade County Community Action, "Hunger in Dade County, Florida"	2/85
23.	NEW YORK- Department of Public Health, "Emergency Food Relief in New York"	4/85
24.	ARKANSAS- Arkansas Hunger Project, "Food Stamp Program Participation"	5/85
25.	TEXAS- Dallas Alliance, "The Bitter Harvest"	11/85
26.	MINNESOTA- Food Education and Resource Center "Homegrown Hunger"	12/85
27.	CALIFORNIA-Mayor's Task Force, San Francisco "Feeding the Hungry in the City of St. Francis"	1986
28.	NEW JERSEY- New Jersey Commission on Hunger, "Hunger Report and Recommendations"	1986
29.	MISSOURI- Missouri Association for Social Welfare, "Hunger in Missouri"	3/86
30.	UTAH- University of Utah School of Social Work, "We are the World Too"	4/86
31.	FLORIDA- Florida Task Force on Hunger, "Hunger in Florida: Report to the Legislature"	4/86
32.	NEW YORK- E. Harlem Interfaith Welfare Committee, "Tyranny of Indifference"	5/86
33.	PENNSYLVANIA- United Way of AlleghenyCounty "Hunger in Allegheny County"	5/86
34.	UTAH- Utahans Against Hunger, "Study of Low-Income Households"	5/86
35.	VERMONT- Governor's Task Force on Hunger, "Hunger in Vermont"	6/86

— 36. OHIO- Ohio Hunger Task Force, "Hunger Clients in Greater Cleveland"	6/86
37. FLORIDA- Alachua County Interagency Council, "Hunger in Alachua County"	8/86
→ 38. OREGON- Oregon Food Share, "Profiles of the Hungry"	9/86
39. MARYLAND- Montgomery County, report to U.S. House Select Committee on Hunger	11/86
40. MASSACHUSETTS- Project Bread/Food Banks, "Left Out of the Commonwealth"	12/86
41. NEW YORK- Dutchess County Community Action, "Unfinished Business"	3/87
42. NEW YORK- E. Harlem Interfaith Welfare Committee, "Tyranny of Indifference, II"	7/87
— 43. CONNECTICUT- Connecticut Association for Human Services, "Childhood Hunger Project"	9/87

* * *

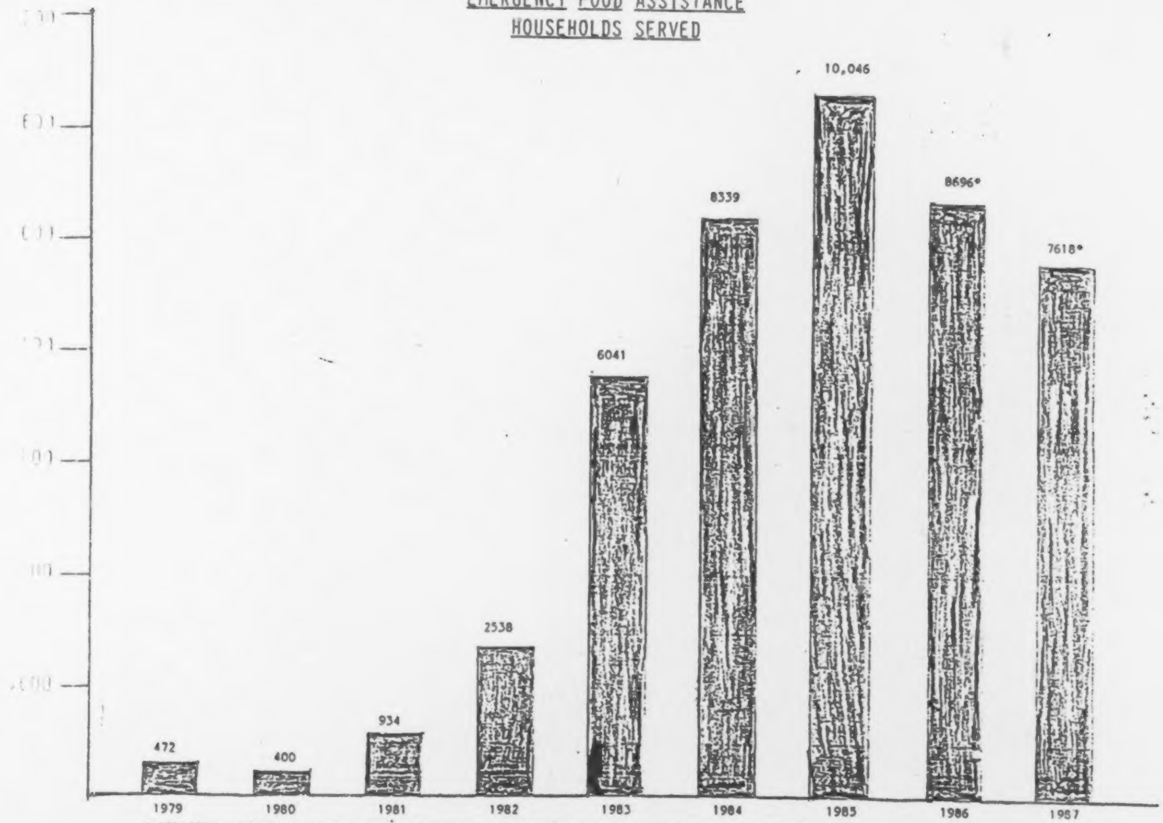
Frequently national leaders face the need to make important policy decisions with an inadequate data base. On other occasions crises arise which demand some response even though a cure is not available. Neither of these circumstances is true in the case of domestic hunger.

The evidence of seventy-five studies over four years yields a good understanding of the seriousness of hunger and its causes. With the federal nutrition programs which proved successful in the 1960s and 1970s, we have available a cure for hunger.

What America has yet to develop is the political will to eradicate hunger.

Attachment 3

HUNGER SERVICES NETWORK
EMERGENCY FOOD ASSISTANCE
HOUSEHOLDS SERVED



* REFLECTS A DECREASE IN HSN STAFF AND FUNDING; NOT NECESSARILY A DECREASE IN CLIENTS / COMMUNITY NEED.

Attachment 4

EMERGENCY FOOD ASSISTANCE
YEAR END SUMMARY
JANUARY 1, 1987 TO DECEMBER 31, 1987

HOUSEHOLDS		7,618
City Residents	4,613 (61%)	
County Residents	3,005 (39%)	
PEOPLE		20,346
Adults	9,347 (46%)	
Children	10,909 (54%)	
PREVIOUS CLIENTS (HOUSEHOLDS)		2,286 (30%)
HOUSEHOLDS WITH A PREGNANT MEMBER		436 (06%)
HOUSEHOLDS WITH A HANDICAPPED/DISABLED MEMBER		1,700 (22%)
HOUSEHOLDS RECEIVING ASSISTANCE FROM NETWORK PANTRIES		5,415 (71%)
HOUSEHOLDS RECEIVING ASSISTANCE FROM EFA SATELLITES		2,203 (29%)

1. AGES: HEAD OF HOUSEHOLD

Under 25	1,180 (15%)
25 - 34	2,797 (37%)
35 - 44	1,757 (23%)
45 - 60	1,216 (16%)
Over 60	668 (09%)

2. HOUSEHOLD COMPOSITION

Family - No Children		414 (05%)
Family - With Children		1,418 (37%)
Single-Parent Family		3,412 (45%)
S-P Female	3,272 (43%)	
S-P Male	140 (02%)	
Single Female		1,256 (17%)
Single Male		1,118 (14%)

3. RACIAL COMPOSITION OF HOUSEHOLDS

Black	4,121 (54%)
White	3,424 (45%)
Other	73 (01%)

4. INCOME SOURCES OF HOUSEHOLDS

AFDC		3,117 (41%)
GA		676 (09%)
SS (SS,SSI,SSDI		1,412 (18%)
VA Benefits		92 (01%)
Work. Comp.		56 (01%)
Jobs		744 (10%)
Full-Time	534 (07%)	
Part-Time	210 (03%)	
Unemployment		153 (02%)
None		1,173 (15%)
Other		195 (03%)

5. HOUSEHOLDS RECEIVING FOOD STAMPS	4,888 (64%)

Attachment 5

PARF Hunger Survey Results - 1987

Statewide Results - Food Pantries

Overall, 390 food pantries from 8 food banks participated in the Survey. The food banks included:

a) the Erie Community Foodbank, Erie.
b) the Greater Philadelphia Food Bank, Philadelphia.
c) the Greater Pittsburgh Community Food Bank, Pittsburgh.
d) Food for Families, Johnstown.
e) Lehigh Valley Food Bank, Bethlehem.
f) Greater Berks Food Bank, Reading.
g) South Central Pa. Food Bank, Steelton.
h) Washington County Food Bank, Washington.

From the 323 pantries that responded to the question, the Survey found that 12.4 % more households had been served in 1986 than in 1985.

Of the 335 pantries that answered the question, 57 % say they have limits on the number of times a household could be helped each year. On the average, the pantries which responded affirmatively to the question say they limited assistance to their programs to slightly over once per month in 1986.

Of the 305 pantries that responded, 19 % state that they had to turn away households each month in 1986 because the agencies had run out of food. The average number of households turned away each month by the pantries which responded affirmatively to the question was 15.9.

Of the 337 pantries that responded to the question regarding difficulties in operating their programs, these were the answers:

a) 25 % said they had trouble obtaining a sufficient quantity of food.
b) 17 % said they had problems in recruiting volunteers.
c) 29 % said they had trouble in raising funds.
d) 5 % stated they had problems in finding or adapting a suitable site.
e) 21 % said they had difficulties in transporting food from the food banks to their sites.
f) 8 % said they had other problems.
(The percentages do not add up to 100 % because multiple answers were given by many pantries).

Of the 324 programs which responded, 78 % stated they could meet a 5 % or more increase in demand for emergency food assistance. Of the pantries which answered affirmatively to the question:

a) 19 % said they would have to take resources away from other programs.
b) 63 % stated they would have to raise additional funds.
c) 37 % said they would have to reduce the amount of food given to each household.
d) 19 % said they would have to utilize other measures.
(The percentages do not add up to 100 % because multiple answers were given by many pantries).

-- Guy Berube

PARF Hunger Survey Results - 1987

Statewide Results - Soup Kitchens

Overall, 89 soup kitchens from 5 food banks participated in the Survey. The food banks included:

a) the Erie Community Foodbank, Erie.
b) the Greater Philadelphia Food Bank, Philadelphia.
c) the Greater Pittsburgh Community Food Bank, Pittsburgh.
d) Lehigh Valley Food Bank, Bethlehem.
e) South Central Pa. Food Bank, Steelton.

From the 78 kitchens that responded to the question, the Survey found that 6.2 % more people had been served in 1986 than in 1985.

Of the 83 kitchens that answered the question, only 1 said it has limits on the number of times a person could be served food.

Of the 82 kitchens that responded, 7 % stated that they had to turn away people each month in 1986 because the agencies had run out of food.

Of the 89 kitchens that responded to the question regarding difficulties in operating their programs, these were the answers:

a) 19 % said they had trouble obtaining a sufficient quantity of food.
b) 21 % said they had problems in recruiting volunteers.
c) 32 % said they had trouble in raising funds.
d) 5 % stated they had problems in finding or adapting a suitable site.
e) 20 % said they had difficulties in transporting food from the food banks to their sites.
f) 15 % said they had other problems.
(The percentages do not add up to 100 % because multiple answers were given by many kitchens).

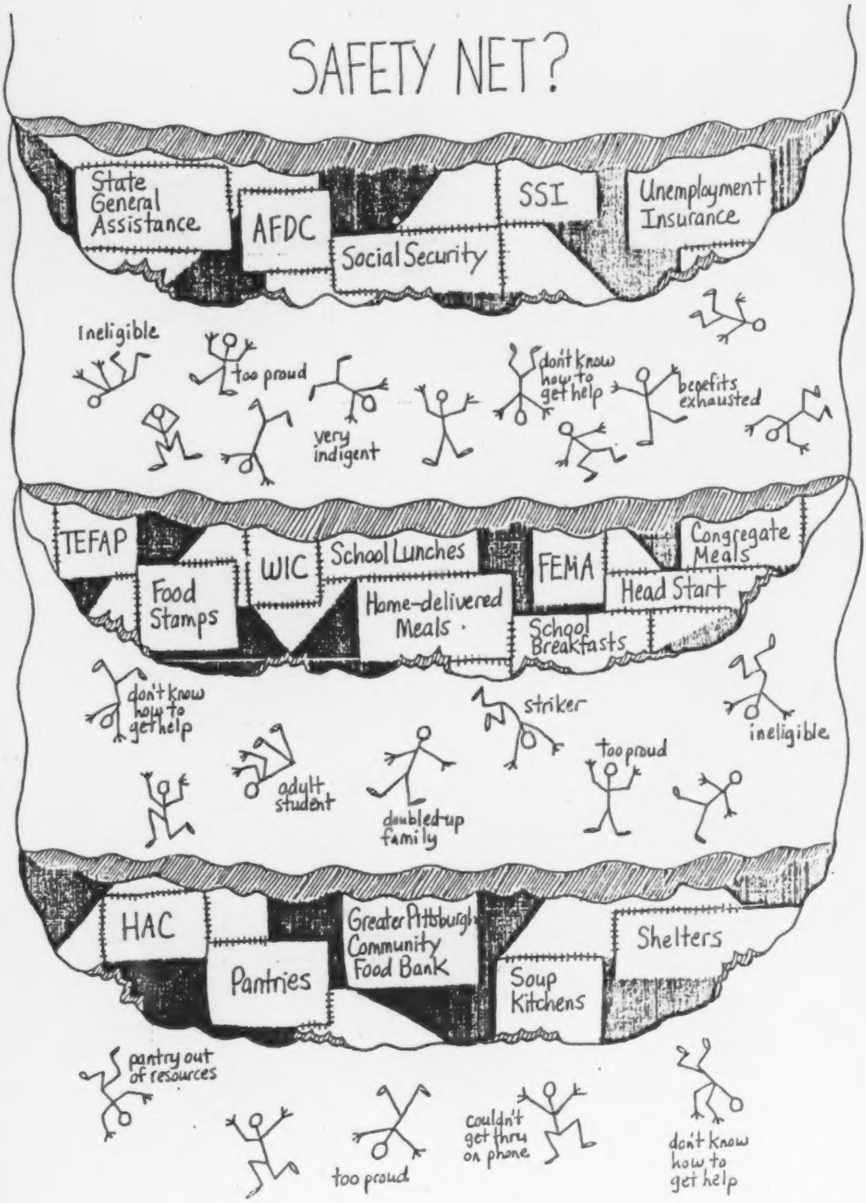
Of the 83 programs which responded, 88 % stated they could meet a 5 % or more increase in demand for food. Of the kitchens which answered affirmatively to the question:

a) 36 % said they would have to take resources away from other programs.
b) 71 % stated they would have to raise additional funds.
c) 19 % said they would have to reduce the amount of food given to each person.
d) 10 % said they would have to reduce the number of days their operations were open.
e) 18 % said they would have to utilize other measures.

(The percentages do not add up to 100 % because multiple answers were given by many kitchens).

-- Guy Berube: June 22, 1987

Attachment 6


SAFETY NET?
State General Assistance
AFDC
SSI
Unemployment Insurance
Social Security
Ineligible
too proud
don't know how to get help
benefits exhausted
very indigent
TEFAP
WIC
School Lunches
FEMA
Congregate Meals
Food Stamps
Home-delivered Meals
Head Start
School Breakfasts
don't know how to get help
striker
ineligible
too proud
adult student
doubled-up family
HAC
Greater Pittsburgh Community Food Bank
Shelters
Pantries
Soup Kitchens
pantry out of resources
too proud
couldn't get thru on phone
don't know how to get help

Attachment 7

THE RIGHT TO FOOD RESOLUTIONS

As passed by the Senate (S.Con.Res. 138)
September 16, 1976, by voice vote

WHEREAS in this Bicentennial Year we reaffirm our national commitment to the inalienable right of all to life, liberty, and the pursuit of happiness, none of which can be realized without food to adequately sustain and nourish life, and we recall that the right to food and freedom from hunger was set forth in the Universal Declaration of Human Rights and in the World Food Conference Declaration of 1974; and

WHEREAS the report entitled "The Assessment of the World Food Situation," prepared for the 1974 World Food Conference, estimated that four hundred and sixty million persons, almost half of them young children, are malnourished, and

WHEREAS nearly half of the human race lives on diets seriously deficient in proteins or other essential nutrients; and

WHEREAS most of this hunger and malnutrition is suffered by the poor in developing countries whose poverty prevents them from obtaining adequate food; and

WHEREAS the demand for food is accelerating and the unprecedented growth in population will add a billion persons to the world's population in less than 15 years; and

WHEREAS the Food and Agriculture Organization, and other recognized authorities, currently estimate that by 1985 the developing countries will experience an annual food deficit of 85 million tons; and

WHEREAS it is in the interest of the United States and all nations to overcome food shortages which cause human suffering and generate economic and political instability; and

WHEREAS the United States proposed, and all nations at the World Conference of 1974 accepted, the bold objective "that within a decade no child will go to bed hungry, that no family will fear for its next day's bread, and that no human being's future and capacities will be stunted by malnutrition"; and

WHEREAS the international community has repeatedly urged the industrialized nations to increase their official development assistance to 0.7 percent of their total national production (GNP), and

WHEREAS the elimination of global hunger and malnutrition cannot succeed without expanded self-help efforts by the developing countries Now, therefore, be it

RESOLVED by the House of Representatives (the Senate concurring), That it is the sense of Congress that

(1) the United States reaffirms the right of every person in this country and throughout the world to food and a nutritionally adequate diet and

(2) the need to combat hunger shall be a fundamental point of reference in the formulation and implementation of United States policy in all areas which bear on hunger including international trade, monetary arrangements, and foreign assistance; and

(3) in the United States, we should seek to improve food assistance programs for all those who are in need, to ensure that all eligible recipients have the opportunity to receive a nutritionally adequate diet, and to reduce unemployment and ensure a level of economic decency for everyone; and

(4) the United States should emphasize and expand its assistance for self-help development among the world's poorest people, especially in countries seriously affected by hunger and malnutrition, with particular emphasis on increasing food production and encouraging more equitable patterns of food distribution and economic growth; and such assistance, in order to be effective, should be coordinated with expanded efforts by international organizations, donor nations, and the recipient countries to provide a nutritionally adequate diet for all.

unofficial transcript

As passed by the House (H.Con.Res. 737)
September 21, 1976, by 340-61

WHEREAS in this Bicentennial Year, we reaffirm our national commitment to the inalienable right of all to life, liberty, and the pursuit of happiness, none of which can be realized without food to adequately sustain and nourish life, and we recall that the right to food and freedom from hunger was set forth in the Universal Declaration of Human Rights and in the World Food Conference Declaration of 1974; and

WHEREAS American agriculture, which encourages individual initiative and efficiency in the production, processing, and distribution of food, has been and is a major source for alleviating malnutrition and famine throughout the world; and

WHEREAS the report entitled "The Assessment of the World Food Situation", prepared for the 1974 World Food Conference, estimated that four hundred and sixty million persons, almost half of them young children, are malnourished; and

WHEREAS nearly half of the human race lives on diets seriously deficient in proteins or other essential nutrients; and

WHEREAS most of this hunger and malnutrition is suffered by the poor in developing countries whose poverty prevents them from obtaining adequate food, and

WHEREAS the demand for food is accelerating and the unprecedented growth in population will add a billion persons to the world's population in less than 15 years; and

WHEREAS the Food and Agriculture Organization, and other recognized authorities, currently estimate that by 1985 the developing countries will experience an annual food deficit of 85 million tons, and the World Food Conference called for rational population policies to help achieve a desirable balance between population and food supply; and

WHEREAS it is in the interest of the United States and all nations to overcome food shortages which cause human suffering and generate economic and political instability, and

WHEREAS the United States proposed, and all nations at the World Food Conference of 1974 accepted, the bold objective "that within a decade no child will go to bed hungry, that no [illegible]

WHEREAS the international community has repeatedly urged the industrialized nations to increase their official development assistance, and

WHEREAS the elimination of global hunger and malnutrition cannot succeed without expanded self-help efforts by the developing countries that concentrate on means to increase food production and expand processing and distribution systems;

Now, therefore, be it

RESOLVED by the House of Representatives, (the Senate concurring), That it is the sense of Congress that

(1) the United States reaffirm the right of every person in this country and throughout the world to food and a nutritionally adequate diet; and

(2) the need to combat hunger shall be a fundamental point of reference in the formulation and implementation of United States policy in all areas which bear on hunger including international trade, monetary arrangements, and foreign assistance, and

(3) in the United States, we should seek to improve food assistance programs for all those who are in need, to ensure that all eligible recipients have the opportunity to receive a nutritionally adequate diet, and

(4) the United States should increase substantially its assistance for self-help development among the world's poorest people, especially in countries seriously affected by hunger and malnutrition, with particular emphasis on increasing food production and encouraging improved food distribution and more equitable patterns of economic growth; and such assistance, in order to be effective, should be coordinated with expanded efforts by international organizations, donor nations, and the recipient countries to provide a nutritionally adequate diet for all, and

(5) the President is requested to provide to the Congress not later than [illegible]

1980, should such an action be necessary.

Another aspect of administrative concern which was given careful consideration is the amount of lead-time which would be required to implement benefit reduction methods. The method chosen for reducing benefits must be one that can be implemented quickly enough to ensure that spending does not exceed appropriations. The more complicated the procedure for reducing benefits, the greater is the amount of lead-time States would need to implement the reduction. Comments from State agencies show that implementation of Alternative 3 would require significantly less time than either Alternative 1 or 2.

The Department has made this decision with the recognition that a benefit reduction will result in inadequate nutritional assistance being provided to low-income families. Benefit reductions will be implemented only if they are required in order to avoid violating the Food Stamp Act.

The current food stamp allotment, which averages 38 cents per person per meal, is set at the cost of the Thrifty Food Plan (adjusted for family size) decreased by 30 percent of the household's net monthly income. The Thrifty Food Plan is the least costly of four food plans developed by the Department; it was designed specifically for low income families. Like the other food plans, the Thrifty Food Plan specifies amounts of foods from each of fifteen food groups which are combined to provide a nutritionally adequate diet.

The Department recognizes that a number of factors make it difficult for many families to obtain an adequate diet on the amount of money which represents the cost of the Thrifty Food Plan. In fact, data on food consumption among low income households indicates that fewer than one in ten families spending an amount of money equivalent to the cost of the Thrifty Food Plan received 100 percent of the Recommended Daily Allowances. Less than half received even two thirds of the Recommended Daily Allowances.

The Thrifty Food Plan does not represent what low income families actually eat. The plan contains less meat, poultry, and fish and more dry beans and grain products than families generally consume. In order to develop a plan which was nutritionally adequate at a very low cost, nutritionists at the Department used a computer model which could alter the average diet of low income households so that it met the Recommended Daily Allowances for most nutrients. The average food purchaser, without specific nutritional skills and training, would find it much more difficult to make the food choices which provide an adequate diet on the amount of money which represents the cost of the plan.

The Department has previously acknowledged that low income families may not get a nutritionally adequate diet using the amount of money which represents the cost of the Thrifty Food Plan. The Agricultural Research Service has described the Economy Food Plan, a precursor to the Thrifty Food Plan at the same cost level, as a diet "for temporary use when funds are low." The Agricultural Research Service also noted that:

> "Studies show that few families spending at the level of the Economy Plan select foods that provide nutritionally adequate diets. The cost of this plan is not a reasonable measure of basic money needs for a good diet. The public assistance agency that recognizes the limitations of its clientele and is interested in their nutritional well-being would recommend a money allowance for food considerably higher than the cost level of the Economy Plan. Many welfare agencies base their food cost standards on the USDA Low-Cost Food Plan which costs about 25 percent more than the Economy Plan." (U.S.D.A., Agricultural Research Service, "Sample Menus and Food Lists for One Week Based on U.S.D.A. Economy Food Plan," page 1.)

The Department is also aware that in areas where food costs are higher than average, low income families will find it even more difficult to obtain an adequate diet using the amount of money set as the cost of the Thrifty Food Plan. The cost of the plan represents average food costs for the nation as a whole. Many low income families live in areas where food costs tend to be higher than average, such as central city areas, and isolated rural areas.

While Alternative 3 will result in households having insufficient food available to obtain a diet of even minimum nutritional adequacy, this would also be the result of Alternatives 1 and 2, as well as any other Alternative to effect a reduction in benefits. It is the Department hope that benefit reductions do not become necessary at any time.

Special Provisions for the Elderly and Disabled

In amending the Food Stamp Act, Congress authorized, but did not require, the Secretary to establish special provisions for reducing benefits to the elderly and disabled. The November 9, 1979 Notice of Intent solicited comments on whether the Department should establish benefit reduction procedures that would treat the elderly and disabled differently than the rest of the caseload.

This issue drew 38 comments. Of those who commented, only 7 favored establishing special provisions for the elderly and disabled. There was little consensus in the reasons expressed for favoring special provisions for the elderly and disabled. One commenter, the Southern Oklahoma Development Association, stated that its reason for favoring such a provision is that the elderly and disabled are most frequently affected by inflation.

Thirty commenters, including 18 State agencies, opposed special provisions for the elderly and disabled. Fourteen commenters, including 10 State agencies, indicated that implementing special provisions for the elderly and disabled would be administratively difficult, primarily because their systems cannot identify these households.

Several State agencies indicated that manual reviews of caseloads would be necessary to identify these households. Two State agencies, including the Iowa Department of Social Services, said that it would take up to a year to identify elderly and disabled households since this data is not completely in current computer systems.[1] The Iowa State agency further stated that implementing special provisions for the elderly would increase administrative costs and would also increase the potential for errors in handling cases.

The State of Connecticut Department of Income Maintenance cited as another administrative problem the fact that States may be forced to create a computer system within a system to handle elderly and disabled cases. A similar comment was made by the State of Minnesota Department of Welfare which stated that special treatment for the elderly and disabled would require developing and maintaining two different issuance systems and then using a third system after reductions were lifted. In addition, as the State of Connecticut pointed out, it would be necessary to track and record various household statistics to keep this group separate from other food stamp households.

The Commonwealth of Virginia Department of Welfare observed that the inclusion of any special provisions in benefit reduction procedures would

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[1] A few commenters mistakenly thought that elderly and disabled households had already been identified when a medical deduction and an expanded shelter deduction were instituted earlier this year for households with elderly or disabled members. As a number of State agencies noted, however, a large number of elderly and disabled households do not receive these new deductions and have not been separately identified. These State agencies observed that locating and separately identifying these households would be costly [illegible]

STATEMENT BY

ERNST L. WYNDER, M.D.

PRESIDENT

AMERICAN HEALTH FOUNDATION

Mr. Chairman and Members of the Committee:

I appreciate the opportunity to testify before you today on S1081, the National Nutrition Monitoring and Related Research Act of 1987 and the importance of diet to health. Let me begin by saying I applaud the intent and direction of this legislation. Having spent more than 30 years involved in research in this area, I have recognized the need for a more coordinated and focused Federal role in developing nutrition research and, most importantly, in implementing that research among the general populace. The bill you have proposed will go a long way towards providing this needed coordination and direction.

Let me add that I congratulate Senator Bingamen not only for introducing this bill but also for his efforts to establish within the Department of Education an office of comprehensive school health education. It is my understanding that this office is presently the subject of a conference committee between the House and Senate. Hopefully, the conference will see fit to approve its establishment.

With regard to the legislation at hand, first, let me address some of its major provisions and then comment generally on the subject of diet, nutrition, and health.

The establishment of an "Inner Agency Board for Nutrition Monitoring and Related Research" between the Department of Health and Human Services and the U.S. Department of Agriculture is a positive development not only from the aspect of increasing coordination between the two agencies but also because the Board will be authorized to draw upon the expertise of the private sector and the academic community. This directive coupled with a recognition that state and local government must be involved should provide the framework necessary for the comprehensive compilation and dissemination of nutrition information. In addition, the creation of a national nutrition advisory council will also help provide the input of eminent scientists and scholars into what we hope will be a Federal depository of nutrition information and research.

It is generally agreed that nutrition significantly influences the state of health of a society and determines its youthful longevity. We are, in fact, "what we eat," as the common saying tells us. Because food may contain toxic or carcinogenic components; because it may be deficient in certain nutrients, or, as appears to be most common in our society, because of the excessive intake of certain food components, nutrition significantly affects mortality and morbidity ranging from infectious diseases associated with high infant mortality to hypertension, cardiovascular diseases, many forms of cancer, osteoporosis, cirrhosis of the liver, and other chronic diseases that are the major causes of death in our society. All of these conditions have a medical, social and economic impact on society. With nutrition playing such an important role in human health and disease, the question is how can we advance the cause of good nutrition through research and the application of research findings.

This bill, intended to establish a coordinated national nutrition monitoring and related research program, effectively addresses the issues involved. By bringing together the Department of Agriculture, Health and Human Services, and Commerce, it will be well positioned to evaluate and advance new research initiatives in nutrition and health and to use existing knowledge to advise the population at large and food manufacturers. In this way, the goal of achieving better nutrition can be attained for all citizens, rich and poor, young and old.

The American Health Foundation, largely with the support of the National Institutes of Health, has, for many years, been involved in both basic and applied nutrition research. Our epidemiological research has contributed to the knowledge that nutritional excesses, principally in the area of fat consumption, significantly contribute to cardiovascular diseases and several types of human cancer. The National Heart, Blood, and Lung Institute through its cholesterol education program has significantly contributed to public understanding in this regard, and the American Health Foundation is doing its part through effective national cholesterol screening. Our applied research activity currently is focusing on a national cholesterol screening project, which has examined more than 200,000 people. This project has confirmed the expected high rate of hyperlipidemics in the general population. The participants in these screenings receive a "Health Passport" containing key information about risk factors for cardiovascular disease (Appendix 1). On the back of this document appears the motto of the American Health Foundation, "No one takes better care of you than you." In order to follow this motto, each of us needs the appropriate health knowledge. In the case of prevention of coronary artery disease, it includes knowing what leads to high cholesterol levels and what our individuals levels are.

A centralized program, as proposed by this bill, could make a Health Passport available to all citizens. Physicians and other health professionals could be encouraged to test all Americans for cholesterol levels, and the food industry could be convinced to manufacture, process, and prepare food products known to yield low serum cholesterol levels.

As another example of our activities to introduce good health and nutrition habits to all segments of society, we recommend that a major function of such a coordinated center would be to establish appropriate nutrition education and risk factor analysis to all schools in this country. Through the Know Your Body (KYB) school health education program, developed by the American Health Foundation, we have tested children in elementary and high school for various health risk factors, including cholesterol levels, and found, as to be expected, that about one/third of the children at ages 8-10 already had cholesterol levels over 180 mg%. These levels are known to place the children at high risk for future coronary artery disease.

Appropriate nutrition education in school is important to decrease the rates of in terms of hyperlipidemia, anemia, and obesity by reaching children when their minds are most receptive. Such school health education efforts can also influence physical fitness, dental hygiene, smoking, substance abuse, teen-age pregnancy, and sexually transmitted diseases. Thus, a coordinated school nutrition education program serves as an entry point for other health issues and could have a major impact on the health of children throughout the country.

With regard to new areas of basic research, present evidence in the cardiovascular field suggests that monounsaturated fats which are concentrated in olive oil do not have the deleterious effects ascribed to saturated fats and may even exert a protective effect on blood lipid levels. Our research has shown that monounsaturated fatty acids also have no effect on the genesis of cancer of the breast and colon in experimental animals. Moreover, epidemiological data from Italy and Greece indicate a lower rate of cardiovascular diseases as well as cancers of the breast and colon in those places that have a relatively high intake of such fatty acids in the form of olive oil. Currently, we are researching the effects of various nuts which are rich sources of monounsaturated fatty acids found in other plant sources such as rapeseed, almonds and walnuts. A coordinated research program could speed up the process of linking research findings from the cancer and heart research fields and determine more quickly their possible benefits. This, in turn, would permit appropriate recommendations to be made to the public and the food industry. Similarly, work on fatty acids or on the role of different vitamins and minerals, if properly coordinated under the bill as envisioned, would more rapidly advance the cause of nutrition research and application. By so doing, it could quickly and effectively provide the American people with advice on an optimal diet. Special recommendations could be made for subsegments such as pregnant women, teenagers, infants, elderly citizens, and persons with specific medical diagnoses.

Nutrition, represents the confluence of a number of scientific disciplines. Therefore, efforts in this area are in particular need of the coordinated efforts of many scientific disciplines. Because nutrition involves the lives of every one of us, it requires careful monitoring of what contributes to good and bad health. The public must receive the most current information available so that they can make effective choices. The bill as presented, can significantly contribute towards this goal. I enthusiastically recommend its adoption.

3/9/88 (1005)

TESTIMONY

on behalf of the

NATIONAL CATTLEMEN'S ASSOCIATION
AMERICAN MEAT INSTITUTE
NATIONAL GRANGE
by

Chuck Ball
Director, Nutrition Policy

Agricultural interests support the development and dissemination of sound nutritional advice to the American public. And we support legislation which would create a comprehensive and coordinated national nutrition monitoring system. We believe that a coordinated nutrition monitoring system would help ensure more timely and accurate information upon which to base sound nutrition policy, as well as ensuring more efficient use of public funds.

But nutrition monitoring is only part of the scope of S. 1081. The same requirement for coordination should be extended to the use of the data derived from nutrition monitoring. Not only should the U.S. Department of Agriculture and the Department of Health and Human Services coordinate their nutrition monitoring activities, they should coordinate their dietary guidance activities, as well.

Therefore, the agricultural groups support a provision to require USDA and HHS to jointly publish the Dietary Guidelines for Americans, and to review and approve all dietary guidance prior to its release to the general public.

Sound dietary guidance is based on state-of-the-art findings in a number of disciplines: epidemiological studies on the relationship of various nutrients to health, food consumption surveys, nutrient composition studies, and a host of others. But most importantly, it requires a broad base of knowledge and sound judgement.

Many Federal agencies are now involved in the various disciplines which should comprise Federal nutrition policy. Typically, each agency plays a lead role in some aspect of the diet-health arena. Yet, under the current system, each is largely autonomous when issuing dietary guidance based on its research findings. And without an exceptional effort to inform and cooperate with other agencies, there is a risk of contradictory dietary guidance coming from various Federal agencies.

Compounding this problem is the fact that science is making advances at a rapid pace. It is becoming more and more difficult for anyone, or any organization, to be knowledgable of all the developments in the many disciplines which should be taken into account when dietary guidance is developed.

Combined with the tendency of many people to oversimplify complex and fragmentary scientific findings into "do's and don'ts," we have a potentially dangerous situation. More often, the effect is confusion, which undermines all our efforts to improve the health of Americans.

Let me offer an example of why coordination is needed. In late 1984, the National Cancer Institute (NCI) planned a pamphlet entitled, "Diet, Nutrition and Cancer--A Guide to Food Choices." The pamphlet contained a number of errors. In particular, it contained several tables which listed the fat content for a variety of foods. Since the objective of the pamphlet was to encourage Americans to make food choices based on fat content, the tables were an important part of the publication.

Unfortunately, NCI was using nutrient composition data that was outdated, and which dramatically overstated the fat content of meat products. Congressional Members intervened, stopping distribution of the pamphlets which had been printed and requiring that they be reviewed by USDA prior to any further distribution. If this pamphlet had been widely distributed, it would not only have done agricultural producers a disservice, it would have misled the American public.

Despite some real progress towards coordination since then, it is inevitable that this type of thing will happen again and again in the absence of a formal process to require coordination. In fact, as agriculture modifies its production practices to produce more healthful products--something which is happening at a rapid pace--it will be more and more difficult for government agencies to stay abreast with state-of-the-industry food production.

For instance, livestock producers have implemented changes in breeding and feeding which are resulting in much leaner animals than were produced in the past. In addition, packers and retailers are implementing "close-trim programs," which means that the fat is trimmed to 1/4-inch or less before each cut reaches the retail meat case. Close-trim programs are one of the biggest changes to ever happen in meat merchandising, and it is happening quickly.

To illustrate the impact of this trend on nutrition monitoring and dietary guidance, I would like to cite a study conducted for the American Meat Institute by John Stanton of the Academy of Food Marketing at St. Joseph's University in Philadelphia. Using USDA's revised nutrient composition data for beef and pork, and assuming that meat cuts were trimmed to 1/4-inch, Dr. Stanton found that red meat contributes 26 percent less fat to American diets than reported in the 1977 National Food Consumption Survey.

Of course, this is based on the assumption that 1/4-inch is indeed the average trim of retail meat cuts. To determine what the actual trim level is, the Beef Promotion and Research Board and USDA's Agricultural Research Service are jointly sponsoring a "market-basket" survey of meat cases nationwide. The results will be announced early next month. But preliminary indications are that the industry has not stopped with trimming fat to only a 1/4 inch, but is going well beyond that in its "War on Fat."

Other segments of the food industry have taken similar steps to produce more healthful products. These changes can have a dramatic impact on dietary guidance, and they are occurring so fast that it is unreasonable to expect all government agencies involved in the dietary guidance process to know their status. This is one reason that USDA must play an integral role in the dietary guidance process.

USDA maintains close contact with the food industry. In fact, it is often the Department of Agriculture that funds the research enabling these changes or monitoring their impact. So USDA is in a good position to know the impact that these developments would have on dietary guidance.

If we are truly concerned about providing accurate and up-to-date dietary guidance to the American public, both HHS and USDA must be involved in the process of developing that guidance.

We also believe that having a single set of dietary guidelines that represents official Federal nutrition policy would help reduce confusion among the public. By involving both USDA and HHS in the development of the Dietary Guidelines for Americans, the Federal government could essentially arrive at a consensus position on diet and health. If this document were to be used as the basis for all Federal nutrition policy, we would make further strides in achieving consistency.

The agricultural groups would support an amendment to S. 1081 which would strike the existing Title III, and replace it with language requiring joint publication of the Dietary Guidelines for Americans by USDA and HHS, and joint approval of all dietary guidance prior to its release. Legislation to accomplish this is expected to be introduced prior to the markup of S. 1081.

A new Title III should define dietary guidance as advice to the American public through any medium on what to eat or changes that should be made to the diet. Examples would include the pamphlet mentioned earlier, "Diet, Nutrition and Cancer: A Guide to Food Choices" and the 1990 "Health Objectives for the Nation." Dietary guidance should not include any rule or regulation issued by a federal agency, nor the conduct or reporting or publishing of any research findings. It's only when that research is translated into dietary recommendations to the public that it would require approval.

None of the agricultural groups expect either department to exert influence in an area in which it has no expertise. When USDA was given the opportunity to review and make recommendations on the Cancer Institute's publication mentioned earlier, the department did not challenge the scientific basis for the premises on which the guidance was based. Instead, USDA limited its comments to those areas for which it had clearly conflicting and more accurate data--the fat composition of various foods. We would expect the same kind of restraint by both departments on any other proposed dietary guidance.

To ensure that the review process does not unduly delay the release of dietary guidance, we recommend that a 90-day time limit be placed on the review process.

In addition to the recommendation that an amendment be adopted to assure the issuance of coordinated dietary advice, we recommend some other changes which we believe would improve S. 1081:

1) In the preamble and everywhere else the term "nutritional quality" appears, substitute the term "nutrient content." We

understand that "nutritional quality" is a technical term used within the nutrition community to mean "nutrient content," but we believe that it implies something else and that more common language would help ensure that the bill is not misinterpreted.

2) In Section 3(1), the following definitions should be used instead of those currently in S. 1081:

> "The term 'nutrition monitoring' means the set of activities necessary to provide timely information about the dietary and nutrient consumption patterns of the United States population."
>
> "The term 'related research' means research necessary to develop uniform indicators, standards, methodologies, technologies, and procedures for conducting and reporting nutrition monitoring and surveillance."

3) The Interagency Board for Nutrition Monitoring and Related Research should not be required to meet every three months. The Board should meet only as needed.

4) In Section 102(a)(8), the option of contracting with an outside body should be left to the discretion of the Secretaries. In addition, the frequency of reports should be driven by the availability of new data.

5) In Section 103(b)(2), the term "stratified probability sample" should be pluralized to take into account that both USDA and HHS are conducting surveys.

6) The requirement for coordinating surveys and improving the data base should be extended to surveys done cooperatively with states, such as the Coordinated State Surveillance System and the Pregnancy Nutrition Surveillance System.

7) The composition of the Advisory Council should be changed. Agricultural representation would be a definite asset, and the specific restrictions in Section 201(c)(1)-(4) on who is appointed to the committee should be lifted in order to allow greater flexibility to those making appointments and to reduce the overall size of the committee.

The term of office for each committee member should be reduced. A five-year commitment from volunteer members is unreasonable, and three-year terms are more common for advisory committees. Shorter terms would also ensure that new ideas are brought to the committee more frequently.

With these changes and a new Title III, the agricultural organizations could whole-heartedly endorse S. 1081.

Once again, thank you for the opportunity to share our concerns about S. 1081. We look forward to working with you and your staff in developing a nutrition monitoring act that we can all support.

Milk
Marketing
mmi inc.

Mr. Chairman, I am Debbie DeLacy, Director of Nutrition Education for the Mid East United Dairy Association and Dairy Nutrition Council headquartered in Columbus, Ohio. I am here today representing Milk Marketing Inc., a farmer owned dairy marketing cooperative of over 7,000 members in eight midwest states, headquartered in Strongsville, Ohio.

I would also like to state for the record that the viewpoint expressed in this statement is representative of the National Milk Producers Federation. This is the national farm commodity organization which represents dairy farmers and the dairy marketing cooperatives they own and operate throughout the United States.

We are pleased to be here to support legislation, S. 1081, which will create a comprehensive and coordinated national nutrition monitoring system.

We believe that a coordinated national nutrition monitoring system is necessary to provide timely and accurate information upon which government nutrition policies and funding decisions can be accurately based. In addition, our particular industry would benefit from timely and accurate data which can be used in formulating our research initiatives and public education programs.

We also emphatically believe, and insist, that the nutrition monitoring legislation include a comprehensive and coordinated procedure by which dietary guidelines and guidance of all government agencies are issued to the general population to eliminate the current situation that can only be described as conflicting, confusing and contradictory.

Nutrition Monitoring

Perhaps no segment of the American population better understands the need for sound nutrition policies than the American farmer. It is the farmer, after all, who produces this nation's abundant food supply.

Farmers have been pioneers in implementing nutritional information and research into the diets of their livestock. Their livelihoods have been enhanced by nutrition research and monitoring of individual animal forage which results in increased animal productivity and growth.

The S. 1081 which would create a monitoring system for human nutrition in the United States is simple and sound government policy: to coordinate the many government nutrition surveys, programs, expenditures, and policies based on timely and accurate information. Taxpayers are better served if our limited financial resources are spent wisely in a comprehensive and coordinated fashion rather than on unnecessary duplication.

We support the concept of nutrition monitoring to insure that the American population utilizes our food resources in the best way possible for their health, growth and development.

Dietary Guidelines and Guidance

Mr. Chairman, Title III of the bill was attached per the request of agriculture organizations. We believe that the U.S. Government should speak with one, consistent voice on dietary guidelines. Our preference would be that the Secretary of Agriculture have veto power over dietary guidance issued by any government agency.

However, a coordinated procedure between the Secretaries of Agriculture and Health and Human Services along with a checklist which forces agencies to identify who the dietary guidance is intended for, who might be at risk if they follow the guidance, what previous research or findings is being overruled or challenged and so forth would hopefully work as an acceptable compromise.

Like other commodity and farm groups, the dairy industry is very concerned about the impact the U.S. dietary guidelines have had on the public's overall nutrition knowledge.

The focus on fat, cholesterol, sodium and other "bad" components of food has completely distorted the public knowledge of the overall, daily nutrient needs, the variation that occurs throughout life and the role of genetics or health factors.

How many Americans know that children need more fat than adults for energy and growth? How many people realize that cholesterol levels may be controlled by genetics and not diet? How many people realize that attemptr to completely eliminate sodium from their diets could impair their health?

I bet most Americans would be absolutely amazed to know that there are more grams of fat in a chef salad (23.5 grams) without the dressing than a cheeseburger (15 grams) purchased at a fast food restaurant (MacDonalds). Add one tablespoon of Italian dressing to the salad and you add 9 grams of fat.

The trend to judge certain foods as "bad" due to its natural components, we believe, is a direct result of the dietary guidelines. While that was not the intent of the guidelines, it certainly has become the effect as the guidelines get translated into recommendations on diet for Americans.

Therefore, we submit that government's role in issuing dietary guidelines and guidance must be re-examined. We must have a public discussion on the impact the dietary guidelines, their emphasis on the negative rather than the positive, how the Dietary Guidelines and other agency guidance get issued, reported and interpreted to the general public, and what process can be established to provide nutrition and diet recommendations by government agencies in a clear and consistent fashion.

The government's responsibility to insure that there is adequate food through both its agriculture and human nutrition programs is not being challenged. We are challenging the procedure, the substance and the lack of overall consistency in the government dietary recommendations.

Milk
Marketing
mmi inc.

We believe it is time to redirect the focus of the government's dietary recommendations back to the basics, to encourage the public to eat from the basic food groups in moderation; to recognize that the majority of the population is not "at risk" and best served by following this basic guideline.

In conclusion, Mr. Chairman, we support S. 1081 which will create coordination between government agencies in their collection and reporting of nutrition data.

We would like to see Title III revised to include a one-Secretary veto over all government agencies dietary guidance or, at a minimum, creation of a checklist which will force agencies to report their recommendations in a manner that is easily understood by the general public and eliminate the confusion that is currently created by contradictory recommendations from different agencies.

STATEMENT BY SENATOR RUDY BOSCHWITZ

BEFORE THE SENATE GOVERNMENTAL AFFAIRS COMMITTEE

MARCH 22, 1988

Mr. Chairman, I am pleased to have this opportunity to appear before the Governmental Affairs Committee and express my support for the National Nutrition Monitoring Act (S. 1081) of which I am a cosponsor. I commend you for holding this hearing today to consider this bill designed to monitor the nutritional health of Americans.

I have been supportive of efforts to establish a national nutrition monitoring system. Back in the 99th Congress I was a cosponsor of nutrition monitoring legislation. Many of the members of this Committee worked during the waning hours of the last Congress to try and get that legislation passed.

As a member of the Senate Agriculture Committee, I joined the Nutrition Subcommittee because of my interest and concern about hunger and nutrition issues and the federal role in addressing the problem of alleviating hunger. The existing federal nutrition programs (such as food stamps, school breakfast and lunch, child care food, and WIC) have made a substantial contribution to reducing hunger. While these federal nutrition programs have not relieved all hunger in our nation, they have surely gone a long way toward providing nutritious food for our nation's poorest people. I look forward to working with my colleagues here in the Senate in our continued fight against hunger.

As a Senator who is a strong supporter of the federal nutrition programs, both food stamps and the array of child nutrition programs, I believe it is vital that we have accurate, timely data to determine the effectiveness of our efforts to improve the nutritional status of needy Americans. The President's Task Force on Food Assistance pointed out the lack of information in this area. They recommended a number of steps to better coordinate and disseminate nutritional data including integrating information from the two major nutrition surveys and getting the information out in a timely manner. While improvements have been made in recent years, this legislation will create a comprehensive and coordinated nutrition monitoring system to provide up-to-date information on our citizen's nutritional status.

This legislation will help us gather this information by coordinating the efforts of the Department of Agriculture and the Department of Health and Human Services. This coordination will be achieved through a 10-year National Nutrition Monitoring and Related Research Program and an Interagency Board for Nutrition Monitoring. In addition, this legislation will provide for a National Nutrition Monitoring Advisory Council to provide scientific and technical assistance on the development and implementation of the coordinated plan. The bill also is designed to coordinate the efforts of federal agencies regarding dietary guidance.

I believe that this legislation will provide us with important tools to assess the nutritional status of Americans, particularly the effect of the federal nutrition programs, and ultimately help us design more effective programs to alleviate hunger and malnutrition. I urge Committee members to give favorable consideration to this nutrition monitoring bill and I also look forward to working with you when this bill comes up for a vote on the Senate floor.

TESTIMONY OF
REP. BUDDY MACKAY (D-FL)
BEFORE THE
SENATE COMMITTEE ON GOVERNMENTAL AFFAIRS
S. 1081, NATIONAL NUTRITION MONITORING AND RELATED RESEARCH ACT OF 1987

March 22, 1988

Mr. Chairman and Members of the Committee, I appreciate this opportunity to share with you my views on the importance of a comprehensive national nutrition monitoring system and the need for a public law based on S. 1081 and its companion bill H.R. 2151.

A proposal for a comprehensive national nutrition monitoring system was called for in P.L. 95-113, the Food and Agriculture Act of 1977. Over the past ten years, such a system has been planned and replanned without defining sequential priorities and resources required. Components of the system in place prior to 1977 have been continued and modified in a piecemeal fashion, and other components have been endlessly delayed. Today, the U.S. still does not have in place a strategic and coordinated system to assess and guide the nutritional health of the public or to establish priorities for the allocation of limited budgetary resources for federal nutrition monitoring activities.

Data resulting from a comprehensive national nutrition monitoring system will not only provide imperative early warning signals and trends regarding the nutritional status of the public, but will provide information essential to the establishment of prudent national nutrition policies, human nutrition research agendas, nu-

TRITION EDUCATION GUIDELINES, AS WELL AS FOOD, NUTRITION AND HEALTH CARE INTERVENTION PROGRAMS DESIGNED TO ENHANCE THE QUALITY OF LIFE OF OUR CITIZENS. WITHOUT ADEQUATE AND TIMELY NUTRITIONAL STATUS DATA, NEITHER THE SCIENTIFIC COMMUNITY, THE EXECUTIVE BRANCH, OR THE LEGISLATIVE BRANCH HAVE OBJECTIVE DATA ON WHICH TO DETERMINE FEDERAL PRIORITIES AND THE APPROPRIATE EXPENDITURES FOR NUTRITION RELATED ACTIVITIES.

THE ADMINISTRATION HAS OPPOSED PROPOSALS SIMILAR TO S. 1081 TO MANDATE A COMPREHENSIVE AND COORDINATED NATIONAL NUTRITION MONITORING SYSTEM ON TWO MAJOR POINTS -- THE LACK OF AN AUTHORIZATION OF APPROPRIATIONS, AND THE REQUIREMENT OF A MECHANISM TO COORDINATE AND FIX RESPONSIBILITY WHICH IS VIEWED TO BE CUMBERSOME AND COSTLY. LET ME ADDRESS THE INTENT OF THE BILL ON EACH OF THESE ISSUES:

FUNDING. THE BILL DOES NOT CONTAIN AUTHORIZATION OF APPROPRIATIONS. HOWEVER, SECTION 106 REQUIRES EACH AGENCY COMMITTED TO IMPLEMENTING THE COORDINATED PROGRAM AND COMPREHENSIVE PLAN, REQUIRED BY SECTIONS 103 AND 104, TO REQUEST ANNUAL FUNDING LEVELS, IN A SEPARATE LINE ITEM, DETERMINED BY EACH AGENCY TO BE NECESSARY TO COMPLETE THE PLAN AND TO BE CONSISTENT WITH AN INTERAGENCY BUDGET DEVELOPED BY THE EXECUTIVE BRANCH. THIS PROVISION GIVES THE EXECUTIVE BRANCH THE FLEXIBILITY TO PROPOSE BOTH THE PRIORITIES AND THE LEVEL OF EFFORT WARRANTED AND REQUIRED BY THOSE PRIORITIES. LIKEWISE, THIS PROVISION GIVES THE PUBLIC AND THE LEGISLATIVE BRANCH, FOR THE FIRST TIME EVER, THE OPPORTUNITY

TO EVALUATE THE PRIORITIES AND THE APPROPRIATENESS OF THE BUDGET REQUEST WITHIN THE ANNUAL CONGRESSIONAL AUTHORIZATION AND APPROPRIATION PROCESS.

USDA REPRESENTATIVES HAVE STATED THAT A REQUEST FOR NEW MONEY FOR NUTRITION MONITORING IS NOT LIKELY IN VIEW OF TODAY'S BUDGET DEFICITS. IF THIS IS THE CASE, I BELIEVE THEIR PRIORITIES ARE MISPLACED. HOW CAN THIS ADMINISTRATION PROPOSE A LONG-TERM BILLION DOLLAR NEW INITIATIVE SUCH AS THE SUPERCONDUCTING SUPERCOLLIDER AND NOT GIVE PRIORITY TO A LONG-STANDING MILLION DOLLAR NATIONAL RESOURCE SUCH AS AN EFFECTIVE AND EFFICIENT NATIONAL NUTRITION MONITORING SYSTEM. OUR EFFORTS TO MAINTAIN THE NATION'S COMPETITIVE EDGE IN THE WORLD MARKETPLACE WILL BE OF NO AVAIL IF WE DO NOT HAVE ADEQUATE DATA TO ENHANCE AND MAINTAIN THE NUTRITION STATUS AND HEALTH OF OUR CITIZENS.

IN FACT, THE NUMBER ONE PURPOSE OF S. 1081 IS TO "MAKE MORE EFFECTIVE USE OF FEDERAL AND STATE EXPENDITURES FOR NUTRITION MONITORING, AND ENHANCE THE PERFORMANCE AND BENEFITS OF CURRENT FEDERAL NUTRITION MONITORING AND RELATED RESEARCH ACTIVITIES". USDA HAS ALSO MAINTAINED THAT THE REQUIREMENTS OF THIS BILL, TO DEVELOP PROGRAMS TO STIMULATE METHODS RESEARCH AND TO ASSIST STATE AND LOCAL GOVERNMENTS IN DEVELOPING THE CAPACITY TO CONDUCT MONITORING AND SURVEILLANCE OF NUTRITIONAL STATUS, WOULD DRAIN MONEY AWAY FROM FUNDS ALREADY APPROPRIATED FOR NUTRITION MONITORING ACTIVITIES. SINCE ENHANCED METHODS RESEARCH AND ASSISTANCE TO STATE AND LOCAL GOVERNMENTS COULD MAKE EXTREMELY SIGNIFICANT

CONTRIBUTIONS TO THE COST-EFFECTIVENESS, EFFICIENCY, AND BENEFITS OF THE CURRENT SYSTEM, PERHAPS PRESENT DATA COLLECTION ACTIVITIES SHOULD BE PUT ASIDE UNTIL MORE PRECISE, LESS INVASIVE, AND LESS COSTLY METHODS FOR DETERMINING DIETARY AND NUTRITIONAL STATUS ARE DEVELOPED AND UNTIL MECHANISMS TO INCORPORATE CORE DATA COLLECTED BY STATE AND LOCAL PUBLIC HEALTH AGENCIES ARE IN PLACE.

COORDINATION STRUCTURE. USDA HAS CONTENDED THAT THE REQUIREMENT OF A FEDERAL INTERAGENCY BOARD FOR NUTRITION MONITORING AND RELATED RESEARCH IN SECTION 101 AND A NON-FEDERAL NATIONAL NUTRITION MONITORING ADVISORY COUNCIL IN SECTION 201 ARE CUMBERSOME AND COSTLY. AS DISCUSSED IN THE SCIENCE AND TECHNOLOGY COMMITTEE'S REPORT 99-481, PART 1, ACCOMPANYING H.R. 2436, A BILL SIMILAR TO S. 1081, THE JOINT CHAIRPERSONS OF THE BOARD MAY DELEGATE THE FUNCTIONS DESIGNATED TO THE BOARD TO AN EXISTING INTERGOVERNMENTAL COORDINATING MECHANISM, SUCH AS THE EXISTING INTERAGENCY COMMITTEE ON HUMAN NUTRITION RESEARCH.

A NATIONAL NUTRITION MONITORING ADVISORY COUNCIL IS ESTABLISHED TO REPRESENT THE SCIENTIFIC AND TECHNICAL VIEWS AND RECOMMENDATIONS OF A BROAD RANGE OF EXPERTS, AND TO SERVE AS A COMMUNICATION LINK AMONG THE PUBLIC AN PRIVATE SECTORS, THE EXECUTIVE BRANCH AND THE LEGISLATIVE BRANCH. THE SCIENCE AND TECHNOLOGY COMMITTEE INTENDS THAT THE ADVISORY COUNCIL WOULD REPLACE AND EXTEND THE FORMER JOINT NUTRITION MONITORING EVALUATION COMMITTEE ESTABLISHED BY THE ADMINISTRATION TO INTERPRET AND REPORT ON DIETARY AND NUTRITIONAL STATUS DATA.

THROUGHOUT THE FEDERAL GOVERNMENT ADVISORY COMMITTEES ARE USED TO SEEK RECOMMENDATIONS OF SCIENTIFIC EXPERTS AND USERS OF FEDERAL PROGRAMS AND DATA. THIS PROVISION OF THE BILL SIMPLY INSURES THE NUTRITION MONITORING PLAN AND PROGRAM WILL HAVE A NON-FEDERAL ADVISORY GROUP TO PROVIDE ADVICE ON THE DEVELOPMENT OF THE PLAN AND ON EVALUATION OF THE OUTCOMES. CURRENT ACTIVITIES DO NOT HAVE THE BENEFIT OF AN ADVISORY GROUP. IN MY VIEW, THE AVAILABILITY OF SCIENTIFIC AND TECHNICAL ADVISE ON AN ACTIVITY AS COMPLEX AND UNDERDEVELOPED AS NUTRITION MONITORING IS NOT COSTLY, BUT RATHER COST-EFFECTIVE. THE BENEFITS COULD FAR OUTWEIGH THE COST OF THE INVESTMENT.

THE ADMINISTRATION HAS ALSO EXPRESSED CONCERN THAT THE SPONSORS OF THIS BILL ARE UNAWARE OF THE PROGRESS WHICH HAS BEEN MADE AND CONTINUE TO CITE PROBLEMS PRIOR TO 1981. ON THE OTHER HAND, THEY ADMIT THAT MUCH OF THE PROGRESS HAS RESULTED FROM THE PRESSURE OF ANNUAL HEARINGS AND DIRECTIVES BY THE HOUSE SCIENCE, SPACE, AND TECHNOLOGY COMMITTEE AND THE AGRICULTURE COMMITTEE, AS WELL AS THE THREAT OF A LEGISLATIVE MANDATE AS PROPOSED IN S. 1081 AND H.R. 2151.

THE ADMINISTRATION HAS INDEED IMPLEMENTED SEVERAL PROVISIONS OF THE BILL, IN PART TO ILLUSTRATE THAT THE BILL IS NO LONGER NECESSARY. I BELIEVE THE REVERSE IS TRUE. LET ME GIVE A FEW EXAMPLES.

o IN 1983, USDA AND DHHS CONTRACTED WITH THE NATIONAL ACAD-

EMY OF SCIENCES TO REVIEW THE USES OF FOOD CONSUMPTION DATA. UNFORTUNATELY, THE STUDY FOCUSED ONLY ON DIETARY INTAKE DATA AND DID NOT INCLUDE BIOCHEMICAL DATA USED TO DETERMINE NUTRITIONAL STATUS. THE NATIONAL ACADEMY OF SCIENCES RECOMMENDED AGAINST THE SPECIFIC CONTINUOUS DATA COLLECTION PROCEDURE PROPOSED BY USDA AND STATED THAT, "THE COMMITTEE DOES NOT BELIEVE THAT THE PANEL APPROACH IS AS LIKELY TO BE AS EFFICIENT AS A CONTINUOUS FIVE YEAR MOVING AVERAGE SAMPLING TO DETECT CHANGES IN FOOD CONSUMPTION PATTERNS OF SUBSECTIONS OF THE POPULATION THAT CANNOT BE WELL IDENTIFIED BEFORE HAND". IN SPITE OF THIS RECOMMENDATION, USDA PROCEEDED WITH THE SURVEY NOW KNOWN AS THE "CONTINUING SURVEY OF FOOD INTAKES BY INDIVIDUALS." DHHS, HOWEVER, DESIGNED THEIR NEXT NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES-III), CURRENTLY BEING FIELD TESTED, ON THE NATIONAL ACADEMY OF SCIENCES RECOMMENDATION TO DISTRIBUTE DATA COLLECTION FOR THE TOTAL POPULATION SAMPLE OVER FIVE YEARS.

o A JOINT NUTRITION MONITORING EVALUATION COMMITTEE WAS ESTABLISHED AND A REPORT ISSUED IN JULY, 1986. THE REPORT INCLUDED FOURTEEN RECOMMENDATIONS WHICH ARE IN CONCERT WITH THE PROPOSALS SET FORTH IN S. 1081 AND H.R. 2151, AND IN MANY CASES ARE IDENTICAL.

o THE ULTIMATE GOAL OF THE 1981 DHHS/USDA "JOINT IMPLEMENTATION PLAN FOR A COMPREHENSIVE NATIONAL NUTRITION MONITORING SYSTEM" WAS TO CONDUCT IN 1987 THE FIRST COORDINATED USDA NATIONWIDE FOOD CONSUMPTION SURVEY (NFCS) AND DHHS NATIONAL HEALTH AND NU-

TRITION EXAMINATION SURVEY (NHANES) THROUGH THE "DEVELOPMENT OF COORDINATED AND COMPARABLE SURVEY DESIGNS ---." THAT GOAL REMAINS TO BE MET. THE NFCS BEGAN DATA COLLECTION AND NHANES-III BEGAN FIELD TESTING IN 1987. HOWEVER, THE DHHS BUDGET REQUEST FOR FY 1989 APPEARS TO BE INADEQUATE TO ACHIEVE THE INITIAL SURVEY DESIGN. FOR THE FIRST TIME AN IDENTICAL FOOD COMPOSITION DATA BASE WILL BE USED BY THE SURVEYS; HOWEVER, AGREEMENT BETWEEN THE TWO DEPARTMENTS ON MOST OF THE OTHER NECESSARY LINKAGES BETWEEN THE TWO SURVEYS HAVE NOT BEEN REACHED.

THESE EXAMPLES ILLUSTRATE THAT SOME PROGRESS HAS BEEN MADE. THEY ALSO ILLUSTRATE THE NEED FOR LEGISLATION TO PROVIDE THE PUBLIC AND CONGRESS ALIKE WITH AN OPERABLE PLAN TO BE USED AS A GUIDE FOR MONITORING FUTURE PROGRAMS, SETTING BUDGETARY PRIORITIES, AND ENSURING THAT A COST-EFFECTIVE NATIONAL NUTRITION MONITORING SYSTEM WHICH TAKES ADVANTAGE OF APPROPRIATE RECOMMENDATIONS IS IN PLACE.

THE BILL BEFORE YOU IS IDENTICAL TO THE BILL PASSED BY THE HOUSE ON JUNE 26, 1986, EXCEPT FOR TITLE III -- DIETARY GUIDANCE. THIS TITLE WAS INTERPRETED BY SOME TO GIVE VETO POWER TO ONE DEPARTMENT OVER THE OTHER. AS MEMBERS OF THIS COMMITTEE AND THE LABOR AND HUMAN RESOURCES COMMITTEE PREPARED TO BRING THE HOUSE PASSED BILL TO THE FULL SENATE AT THE CLOSE OF THE 99TH CONGRESS, THE LANGUAGE WHICH WAS DEVELOPED AT THAT TIME IS REFLECTED IN THE TITLE III OF S. 1081 AND H.R. 2151.

As you know, a similar bill, H.R. 2436, passed the House on June 26, 1986 by a vote of 305 to 85. I congratulate you for holding the March 2 hearing on the role of nutrition in health and disease, and this hearing today on S. 1081. I encourage you to report the bill to the full Senate for action as soon as possible. I pledge my support to work with the Members of the House Science, Space, and Technology Committee and the Agriculture Committee to respond to the Senate passed bill and bring an expedient recommendation to the House for consideration. I believe it is extremely important that this bill be enacted before the close of the 100th Congress, so that a mandate will be in place prior to the new Administration. Establishing national nutrition monitoring as a national priority is long overdue.

bread for the world
a christian citizens' movement in the usa

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STATEMENT OF BREAD FOR THE WORLD

for the

SENATE COMMITTEE ON GOVERNMENTAL AFFAIRS

March 22, 1989

Bread for the World, the national Christian citizens' hunger lobby, has a long-standing interest in S. 1081, the National Nutrition Monitoring and Related Research Act, which is before your committee today. Since 1979 Bread for the World members have sought legislation that would enable the government and private agencies to have timely and useful data about the nutritional problems of low-income people. We think S. 1081 would put in place a system improving the coordination, gathering and reporting of information that can warn us of potential and actual threats to the health and well-being of U.S. citizens who do not have access to adequate nutrition.

It is appalling that the United States has virtually no up-to-date information on hunger among its population. It is past time to remedy this situation. Since the 1960s, our response to domestic hunger has gone something like this:

Scattered horror stories of people going hungry in our affluent country begin to mount. Newspapers and television stations report features on U. S. hunger. Political leaders hold hearings where anecdotal evidence of hunger is plentiful but hard data often is lacking. Then, depending on perceived citizen support and the extent of media attention, Congress votes to increase or decrease government spending for food assistance programs. Even when we as a nation respond with positive measures, we do so in response to a crisis, not in a planned, ongoing way.

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An important ingredient needed to prevent this roller coaster approach to U. S. hunger is systematic monitoring of the nutritional status of our citizens.

We urge you to pass nutrition monitoring legislation as soon as possible with the following provisions:

1. Coordination of information gathered by agencies that do nutrition monitoring, in order to get comparable data.

2. Focus on continuous surveys of low-income people, "food and household expenditures, participation in food assistance programs, and periods experienced when nutrition benefits are not sufficient to provide an adequate diet." (Section 103 (a) (2))

3. Assistance of state and local government efforts to monitor nutritional status. Local data gathering is essential in order to get useful information on specific hunger problems.

4. Timely reporting of data. Most of the nutrition information we now have is 6 to 10 years old, making it useless in trying to counter current hunger and malnutrition problems.

5. A National Nutrition Monitoring Advisory Council large enough to include a wide range of experts in the fields outlined in Section 201 (b) (1).

We appreciate the opportunity to present these views on this important legislation to assist in responding to the needs of hungry people in the United States.

ESTIMATED COSTS OF S. 1081

APRIL 23, 1987

A. DIRECT COSTS: items mandated by the bill, not including program changes that may result from implementation of the plan that would be developed under the provisions of the bill.

Title/Section	Provision/Explanation	10-Year Cost (Millions)
I/101(d)	Full Time Administrator PS&B for one full time person, GS 15/5 $75,000/year	$ 0.75
I/102(a) (4)	Research Grants (formerly listed as NSF) Assumes funding level previously in bill	$20.00
I/102(a) (5)	State/Local Grants (formerly listed as CDC) Assumes funding level previously in bill	$10.00
I/102(a) (8)	Contract for Annual Reports on Nutrition based on costs for similar contracted reports $450,000/year	$ 4.50
I/102(b) (3)		
I/103	Staff to Board for development of plan. Replacement of 5 FTE detailed to Board $260,000/year (Alternative is to reduce level of effort in existing nutrition monitoring programs)	$ 2.60
II/102(i)	Support of National Council travel for 11 members based on costs for existing advisory committees $75,000/year	$ 0.75
III/301/(b)	Review of Dietary Guidance Staff required (?)	
	SUBTOTAL DIRECT COSTS	$38.60
	(NOTE: With the exception of the two grants programs, these costs would be shared by USDA and HHS)	

B. POTENTIAL OTHER HHS COSTS: it is difficult to provide cost estimates prior to the development of the plan called for in Section 103. For example, Section 103(a)(1) states that the plan should be designed to assess and report on a continuous basis the dietary and nutritional status and trends of the United States population" and separately for specified groups. Section 103(a)(2) specifies annual assessment and reporting on a representative sample of the low-income population. The plan could incorporate both of these objectives into one, continuous food and nutrition survey, or it could build some into ongoing surveys such as SIPP (Census) or the BLS Consumer Expenditure Survey, and achieve others through periodic surveys.

Examples of possible additional HHS costs that are readily identified and costed included:

Title/Section	Provision/Explanation	10-Year Costs (Millions)
I/103(a) (1)	Increase sample size of NHANES III provide estimates for high risk groups ($5.5 million/year)	$55.50
I/103(b) (2)	Makes NHANES a Continuous Survey Cost of data collection in 1994-98 (year in 10-year program for which data collection is not currently assumed in budgets $19 million/year	$95.00
I/103(b) (9)	Technical Assistance and Training to States Cost for travel, support of workshops and $100,000/year	$ 1.00
	Other costs to be determined as Comprehensive plan is developed	
	SUBTOTAL POTENTIAL HHS COSTS:	$151.50
	TOTAL	$190.10

**Alcohol Intake and Risk of Breast Cancer: Epidemiologic Evidence

Several recent reports suggest that women who drink alcoholic beverages may have an increased risk of breast cancer. In this section the data in humans are reviewed, the association with specific beverage type is considered, the dose-response relationship is discussed.

Case-Control Studies

In case-control studies, the alcohol intake of breast cancer patients is compared with that of healthy controls. Of the thirteen case-control studies (1-13) (summarized in table 1), nine were published as full papers (1,2,6-12); of these, a positive association was observed in seven (1,2,7-11). In case-control studies, it is possible that cancer cases may selectively report their prior alcohol intake differently from controls (recall bias). Also, selection of appropriate controls is often difficult. The apparent inconsistency of findings from case-control studies may largely be due to such methodologic problems, as discussed later. Greater weight should generally be placed in results from prospective cohort studies, since these problems are usually minimized.

Prospective Cohort Studies

Results have been published from five cohort studies of alcohol and breast cancer risk conducted among general populations (14-18); four were full papers, and one was an abstract (16). A positive association was observed in all (see table 2).

**a modification of this section will be published as a book chapter co-authored with Meir Stampfer and Graham Colditz.

The largest prospective study was that of Seidman et al. (14), from the American Cancer Society study. The data were very incompletely analyzed and information can only be derived from a figure and are interpretable only among women with no other risk factors for breast cancer. Alcohol intake was dichotomized into less than daily versus daily drinking. Among women drinking daily, the relative risk was approximately 1.2.

Hiatt and Bawol (15) followed approximately 95,000 women in a health care plan. After controlling for race, education, smoking, body mass index, and reproductive factors (all of which made only small differences), relative risks were 0.98 for less than three drinks per day and 1.40 for three or more drinks per day ($p = 0.03$).

Hiatt et al. (16) have presented preliminary data in an abstract based on a separate cohort of 69,000 women. After controlling for age, race, body mass index, and cigarette smoking, the relative risks were 1.5 for those consuming 1-2 drinks per day, 1.5 for those consuming 3-5 drinks per day, and 3.3 for those consuming six or more drinks per day.

Schatzkin et al. (17) analyzed data from the U.S. First National Health and Nutrition Examination Survey. Compared with women reporting no alcohol during the previous year, the relative risks were 1.4 (95% confidence interval 0.8-2.5) for 0.1 to 1.2 grams per day, 1.6 (0.9-3.1) for 1.3 to 4.9 grams per day, and 2.0 (1.1-3.7) for five or more grams per day.

Willett et al. (18) reported findings from the Nurses' Health Study. Compared with women reporting no alcohol intake during the previous year, the relative risks were 1.0 (0.8-1.3) for less than 1.5 grams of alcohol per day, 0.9 (0.7-1.2) for 1.5 to 4.9 grams per day, 1.3 (1.0-1.6) for 5.0 to 14.9 grams per day, and 1.6 (1.3-2.0) for 15 or more grams per day. In this study data on other dietary factors were collected. Controlling for these nutritional factors as well as family history of breast cancer and reproductive variables had no influence on the association of alcohol with risk of breast cancer.

Studies Among Alcoholics

Because of the extreme level of exposure, the breast cancer experience of alcoholic women is potentially of interest. Typically, little is known about possible confounding variables for these individuals, only mortality rather than incidence data are available, and the number of breast cancer cases is very small. Hence these data are fairly uninformative for this issue.

Comment

A positive association between alcohol intake and breast cancer incidence was seen in eight of thirteen case-control and all five large prospective studies. Even with possible publication biases, it is clear that there is an association between alcohol intake and breast cancer incidence that is extremely unlikely to be the result of chance. Given the substantial possibility for biases to obscure a weak association in the context of a case-control study, the overall consistency is remarkable.

Sources of Bias and Their Effect

In case-control studies the true relation between alcohol intake and breast cancer could be distorted by selective exclusion or inclusion of study subjects with respect to their alcohol intake. It has been suggested that due to their illness hospital controls may consume less alcohol than members of the community at large (19). While hospital or clinic controls were used in the majority of positive case-control studies, this was not so in two recent studies (10,11). Thus it seems unlikely that the positive associations in the earlier studies are due to the use of ill subjects as controls. Conversely, the lower participation rates in the positive studies with community based controls raises concern that women with higher alcohol intake selectively refused to participate. However, the control group in the negative study of Webster et al. (6) may have selectively included women with higher than typical alcohol intake; the authors noted that both the cases and controls reported intakes higher than those reported in national surveys.

Errors in recall of alcohol intake that are differential between cases and controls could also distort the relation with breast cancer risk. One might expect that the occurrence of a grave illness might alter recall, and even a slight difference in recall could obscure a moderate association. Illness can alter drinking habits, and current diet influences reporting of remote diet. For these reasons, the use of prevalent cases of breast cancer (4,5,11) will be less reliable than newly diagnosed cases.

Selection and recall bias are not issues in prospective cohort studies, which makes them considerably more likely to provide valid findings. Nevertheless, one cannot completely exclude the possibility that the association of alcoholic beverage intake with breast cancer is due to confounding by another determinant of breast cancer. Many of the studies controlled for the classical breast cancer risk factors (including age at first birth, menopausal status, age at menarche, parity, and family history of breast cancer) as well as other factors that are not established determinants of breast cancer (including relative weight and cigarette smoking). Adjusting for these factors did not perceptibly alter the association of alcohol intake with breast cancer Might the positive associations be secondary to an association of alcohol intake with a dietary factor, such as animal fat? Two conditions must exist for this to occur: alcohol must be associated with the dietary factor and the dietary factor must be associated with breast cancer. Neither of these associations exist with sufficient strength to account for the effect of alcohol. Willett et al. (18) found that moderate alcohol intake was minimally associated with dietary fat, protein, fiber, vitamin A and a variety of other nutrients. Moreover, within this cohort, dietary fat intake was not associated with breast cancer risk (20); this lack of association between fat intake and breast cancer risk is consistent with most epidemiologic evidence based on studies of individuals. Thus, adjustment for dietary factors has not reduced the association of alcohol intake with breast cancer whatsoever (8,9,17,18,21).

Because the established risk factors for breast cancer generally carry modest relative risks similar in magnitude to that of alcohol (i.e., relative risks of 1.5 or 2.0), an unmeasured confounding variable would need to be stronger than known risk factors and also strongly associated with alcohol intake to explain the effect of alcohol seen in the majority of studies. This remains possible, but seems unlikely. Indeed, among women with low baseline risk, higher relative risks were seen for alcohol intake, as would be expected if the association were causal (18).

Effect of Error in Measurement of Alcohol Intake

If unbiased with respect to disease status, errors in the measurement of alcohol intake will generally reduce the strength of associations with breast cancer. Alcohol intake was assessed in many different ways, some rather crude. The validity of the alcohol measurement was evaluated only in one study (18) in which alcohol intake assessed by the standardized questionnaire was very similar to intake measured by a detailed day by day recording of all foods and beverages among a subgroup of 173 participants. The mean intake assessed by the two methods was identical, and the correlation between methods was 0.90. Furthermore, highly significant correlations were observed between the questionnaire measure of alcohol intake and plasma HDL cholesterol, which is known to be sensitive to alcohol ingestion.

Beverage Type

Is breast cancer risk related equally to all types of alcoholic beverages? Only six of the published positive studies collected data on intake of specific alcoholic beverages. Of these, wine was significantly associated with breast cancer in three studies (7-9). Beer was significantly associated with increased risk in three (7,11,18). Liquor was significantly associated with increased risk in two studies (11,18). Rosenberg et al. (2) found all three to have significant associations with breast cancer.

Since women who drink one alcoholic beverage also tend to consume others, the effects of specific beverages are best studied with multivariate analyses that control the use of each beverage for the use of the others. Only two studies (11,18) used this form of analysis; both found independent effects of beer and liquor but not wine. However, the number of wine drinkers who did not regularly consume other beverages was small, so that a similarly positive association of wine could not be excluded with reasonable confidence. Moreover, the positive studies from France and Italy, where wine intake is dominant, suggest that breast cancer is probably linked to all alcoholic beverages.

Dose Response Relationships

The information on this important issue is generally rather crude and inconsistent. Some earlier studies had no quantitative estimate of alcohol intake. The studies with quantitative data all used different units and categories of alcohol intake. To summarize the data, three rough categories of alcohol are used: less than one, one or two, and three or more drinks per day. Of the studies that found any association with alcohol intake, ten provided data for less than one drink per day. Of these, three (2,17,18) observed an elevated risk. In the study of Willett et al. (18), no increase was found below one-half drink per day, while in the report of Schatzkin et al. (17) an elevated risk was seen even below that level. Of the same ten studies, nine (2,5,7,8,10,11,16-18) found elevated relative risks of 1.3 to 2.4 at the level of about one or two drinks per day. (In some instances this was not strictly clear since the highest category was "one or more drinks per day".) In two of the eleven positive studies with relevant data, an increased risk was found only with three or more drinks per day (9,14). Three other studies had elevated relative risks at that level (7,8,16). In the prospective studies, women drinking more than 15 grams (more than one drink) per day, had relative risk estimates that fell between 1.4 and 3.3. The effect of heavier intake is unknown since few studies had sufficient participants with very high alcohol intake; the study of Hiatt et al. (16) suggests that some additional increase in risk may be observed among these women. Taken together, these data seem to indicate a 50 to 100 percent increase in risk for one or two drinks per day and suggest a smaller increase in risk may exist for the use of less than one drink per day.

It is unclear whether it is recent or more remote (or perhaps cumulative) intake which is important. If current intake is merely a marker for consumption during a biologically more relevant time (e.g., before age 20), the impact of alcohol may have been substantially underestimated in these studies. There is almost no information on this important question, but data from Harvey et al. (11) suggest that alcohol intake before the age of thirty years accounted for the entire positive association. Although the number of women who drank before age thirty and later stopped was small, they appeared to experience an elevation in risk that was similar to those who continued to drink. This relationship with drinking at younger ages is consistent with other data indicating that the breast is particularly susceptible during early adult life to factors that influence cancer risk. Obviously, additional data are needed.

In several studies information has been obtained on the risk associated with past alcohol intake; however, it is generally not known how long in the past alcohol use stopped or what was the prior level of intake. Hiatt et al. (16) found an increased risk among past drinkers compared with women who never drank (relative risk 2.2), as did Rosenberg et al. (2) (relative risks 1.3 to 1.6), but Willett et al. (18) did not (though the number of past drinkers was small).

Effect Modification

It is possible that the alcohol - breast cancer association varies among different subgroups of women. Age or menopausal status have been most frequently examined; because of their high correlation they are considered together. Of the six studies that examined this interaction (9,10,11,16-18), four observed a higher relative risk among younger or premenopausal women, one reported no evidence for an interaction (11) and one found a higher relative risk among postmenopausal women (16).

Although the data are inconclusive, one might speculate that a higher relative risk among younger women might be related to the finding of Harvey et al. (11) that the effect of alcohol was attributable to use before age thirty. If so, the use of recent alcohol intake as an exposure would lead to increasing misclassification with advancing age, and a concomitant reduction in relative risk. However, it does not explain the major inconsistent study (6) since the participants in that case-control study were all under 55 years of age.

The only other suggestion of an interaction observed in more than one study is a higher relative risk among thin women (17,18). Perhaps this simply represents a higher dose per kilogram of body mass, but expressing alcohol intake this way did not appreciably alter the relative risks in the latter study.

Conclusion

Current epidemiological data are reasonably consistent in demonstrating an association between alcohol intake and risk of breast cancer. The association appears to be present for all forms of alcoholic beverages, and is very unlikely to be the result of chance. There seems to be a dose-response effect, but the shape of the curve is not well delineated. The present evidence is insufficient to conclude that the association is one of cause and effect, but no more plausible explanation for the association has been proposed. Although the magnitude of the effect is relatively modest, the potential public health impact is large since moderate alcohol intake is so common, and because there are few feasible ways to reduce risk of breast cancer. Moderate alcohol intake may confer a reduced risk of heart disease (22), and this should also be considered in weighing the risks and benefits.

Table 1. Case-control Studies of Alcohol and Breast Cancer

Study	Population	Cases	Controls	Relative Risk (vs. no alcohol)	Comment
				Total Wine Beer Liquor	
Williams & Horm (1979)	U.S. Third National Cancer Survey	Approx. 600	Other cancers, a large number (oz/wk)x(yrs)	<51 oz-year 1.28 1.67 1.18 1.43 ≥51 oz-year 1.55 1.08 1.35 1.44	Controlled for smoking, age, race
Rosenberg et al (1982)	USA, Canada, Israel	1152	519 endometrial or ovarian cancer cases 2702 non-malignant disorders	Cancer controls (vs never drinker) <4 days/wk= 1.5 1.8 2.0 1.2 ≥4 days/wk= 2.0 2.3 2.2 2.1 Ex-drinker 1.3 - - - Non-malignant Disorder Controls <4 days/wk 1.9 2.2 1.2 1.2 ≥4 days/wk 2.5 1.9 2.1 2.5 Ex-drinker 1.6	Control for SES and reproductive factors had minimal effect on RR
Byers et al (1982) (letter)	USA, Roswell Park, New York	1314	770 non-neoplastic conditions	Drinks/Month 0 (Never) 1.0 0 (Ex) 0.59 <1 1.11 1-8 1.02 9-25 1.09 26+ 1.13	No relation with beer, wine, liquor
Paganini-Hill et al (1983) (letter)	USA, retirement community	239 prevalent cares	239 matched community controls of similar social class	Never drink=1.0 ≤ drink/day= 1.0 + drink/day= 1.0	No effect for beer, wine, liquor
Begg et al (1983) (letter)	USA Eastern Oncology Group	997	730 (other cancer patients)	0 drinks/wk 1.0 1-7 " " 0.9 (0.9,1.1) 7+ " " 1.4 (0.9,2.0)	Adjusted for age and smoking
Webster et al (1983)	USA, multi-centered study, based on tumor registries	1226 <55 years of age	1279 random-digit dailing, 85% participation	0 gm/week 1.0 <50 0.9 (0.7-1.2) 50-149 0.9 (0.7-1.2) 150-199 1.1 (0.7-1.7) 200-249 1.1 (0.7-1.9) 250-299 1.0 (0.5-1.7) >300 1.1 (0.6-1.8)	Alcohol questions not clearly directed to period before diagnosis. No effect of beer, wine, liquor

Le, et al (1984)	France, private clinics	1010 total, 500 with detailed data	1950 surgical clinic pts. 945 with detailed data	Total Cider Beer Wine a.alcohol 1.48 1.21 2.18 1.48 with meals ($p=10^{-4}$) (vs none) b.gm/week 0 1.0 1-79 1.0 (0.7-1.4) 80-159 1.4 (2.0-1.0) 160-239 1.5 (2.1-1.0) 240+ 1.2 (2.0-0.7)	Unknown participation rates Significantly increased risks for beer and wine use, cider and liquor use was uncommon. Control for reproductive factors and dairy products did not affect risk.
Talamini et al (1984)	Northern Italy	368	373 patients with acute conditions	Ever vs. never 2.5 (1.7-3.7) wine: not used 1.0 ≤ 0.5 l/day 2.4(1.6-3.5) > 0.5 l/day 16.7 (3.1-89.7)	high participation rates, controlled for SES and reproductive factors
LaVecchia et al (1984)	Milan Italy	437	437 patients with acute conditions	Total Alcohol 0 drinks/day 1.0 ≤ 3 " / " 1.25 (0.91-1.75) > 3 " / " 2.10 (1.2-3.95)	High participation. Any use of beer RR =1.32 (NS) or liquor RR = 1.44 (NS). Adjusted for reproductive and SES factors, and limited dietary variables. Effect strongest among youngest.
O'Connell et al (1987)	USA, North Carolina	276	1519 community residents	Any alcoholic beverage 0,< 1 drink/wk 1.0 ≥ 1 drink/wk 1.45 (0.97-2.12)	Adjusted for race, estrogen use, oral contraceptive use, cigarette smoking. Effect limited to premenopausal women (RR=1.92). For post menopausal group RR=1.7. No specific beverage data.

Harvey et al (1987) J Nat Can Inst	USA, participants in a national cancer screening	1524 diagnosed 3+ years after entry	1,896 program participants	Never 0.1-13 g/wk 14-91 g/wk 92-182 g/wk 183 + g/wk	1.0 1.12 (0.9-1.3) 1.06 (0.9-1.3) 1.31 (1.0-1.7) 1.66 (1.2-2.4)	Controlled for SES and reproductive factors. Effect almost entirely attributable to alcohol before age 30. Independent effects for beer and liquor.
Katsouyanni et al (1986) Int J Can	Greece, hospitalized cases	120	120 orthopedic patients	Non-significant inverse trend. Alcohol intake levels not specified		Low power. Alcohol consumption not provided but probably low.
Miller et al (1987) Am J Epi abstract	Canada	400 ?details	800	None 1+ drink/day 3+ drinks/day 1+ wine 1+ beer 1+ liquor	1.0 1.0 (0.6-1.5) 1.0 (0.5-1.9) 0.8 (0.5-1.4) 2.5 (1.0-5.9) 1.3 (0.7-2.4)	control for confounders had no effect; controls matched by residence within Toronto; there were only 15% nondrinkers

Table 2. Prospective Studies

	Population	Cases	Relative Risks	Comment
Seidman et al (1982) (not peer reviewed)	American Cancer Society. 365,812 aged 30 to 84. Followed 6 years.	3,130	(Interpolated from figure, among women with no other risk factors) aged 30-54 / aged 55-84 <daily alcohol 1.0 1.0 (daily alcohol) 1.2 1.2	incompletely analyzed.
Hiatt and Bawol drinks/day. (1984)	~95,000 US, health- plan members. Up to 13 years of of follow-up Aged > 15 yrs.	1,169	0 drinks/day 1.0 < 3 drinks/day 0.98 ≥ 3 drinks/day 1.40 (p=0.03)	Could not divide group with less than 3 No data on specific beverages. Controlled for race, education, smoking, BMI, reproductive factors.
Hiatt et al (1987) (abstract)	US, 69,000 Health plan members. Five years of years of follow-up.	303	Non-drinks 1.0 past drinkers 2.2 (1.2-3.9) 1-2 drinks/day 1.5 (1.0-2.3) 3-5 drinks/day 1.5 (0.8-2.8) 6+ drinks/day 3.3 (1.2-3.9)	Controlled for age, race, BMI, smoking. Effect not limited to any specific beverage. RR strongest among white or Hispanic and postmenopausal women.
Schatzkin et al (1987)	USA, First National Health and Nutrition Examination Survey 7,188 women 25-74 years of age. Median follow-up=10 yrs.		121 No drinks- in last year 1.0 >0-1.2 g/day 1.4 (0.8-2.5) 1.3-4.9 g/day 1.6 (0.9-3.1) ≥5 g/day 2.0 (1.1-3.7)	Adjusted for education, BMI, dietary fat, and reproductive factors. No data on specific beverage use. Highest RR among youngest and thinnest women.

Willett et al (1987)	USA, 89,538 registered nurses aged 34-59 years followed 4 yrs.	601	0 g/day	1.1	Significantly increased RR independently for 5+ grams/day of beer= 1.4 (1.1-1.8), liquor= 1.4 (1.2-1.7), but not wine= 1.1 (0.9-1.4). RR was strongest among younger and thinner women and those without other risk factors for breast cancer (2.5, 95% C.I. (1.5-4.2)
			<1.5 g/day	1.0 (0.8-1.3)	
			1.5-4.9 g/day	0.9 (0.7-1.2)	
			5.0-14.9 g/day	1.3 (1.0-1.6)	
			≥15 g/day	1.6 (1.3-2.0)	

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Diet and Breast Cancer

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Introduction

For the last decade the dominant hypothesis relating diet with breast cancer has been that a high intake of fat increases the risk of this disease. Data and methodologic issues related to this association are therefore discussed in detail in the first section of this overview. Several alternate hypotheses are considered; however, relevant data are sparce.

Unrelated to the dietary fat hypothesis, a positive association between alcohol intake and risk of breast cancer been seen in several recent studies. Evidence from human studies addressing this association is examined in the second section of this review.

Dietary Fat and Breast Cancer

Nearly fifty years ago Tannenbaum (1942) showed that the amount of dietary fat could markedly influence the occurrence of mammary tumors in rodents (Tannenbaum, 1942). For decades this knowledge was largely limited to laboratory scientists, and sometimes regarded as a nuisance variable to those investigating more interesting carcinogens. The publication of striking correlations among countries by Armstrong and Doll (1975) between national *per capita* fat consumption and both incidence and mortality rates of breast cancer attracted widespread interest in the larger scientific community (see Figure 1 for a display of similar data by Carroll, 1975). The international differences in breast cancer rates are particularly great for postmenopausal women, which has been used to support the hypothesis that diet should be most strongly associated with breast cancer among these women (de Waard et al, 1964).

The strong enthusiasm for this hypothesis was reflected in the abstract of a case-control study in which a positive, but not statistically significant, relationship was observed between fat intake and risk of breast cancer (Miller et al, 1978):

"The Study has produced evidence of an association between an increased intake of nutrients, especially total fat, in both pre-menopausal and post-menopausal women with breast cancer. Reasons why a weak association might have been anticipated are discussed, and it is concluded that in reality the association is stronger. Furthermore, its consistency with other evidence, both experimental and international, suggests that it is causal.".

INSERT FIGURE 1 HERE

After reviewing the published data, a committee of the National Research Council issued a provisional recommendation that the fat content of the U.S. diet be reduced from an average of 40% to an average of 30% of calories, largely based on an anticipated reduction in breast cancer rates (Committee on Diet, Nutrition and Cancer, 1982). This has subsequently become the focus of a major health promotion campaign by the National Cancer Institute (National Cancer Institute, 1984). In this instance, epidemiologic findings were translated into public policy with remarkable speed. With the considerable advantages of hindsight, the epidemiologic data addressing this relationship will be examined in some detail.

Ecological Studies

The extremely strong international correlation between national *per capita* total fat "disappearance" and breast cancer rates has been noted; this correlation is primarily due to animal fat ($r = 0.83$) since the correlation for vegetable fat is considerably lower (r = 0.18) (Hems, 1978). The limitations of such data have been discussed earlier. In this instance, the association is markedly confounded by any of the many correlates of economic development since the high incidence countries tend to be Westernized populations, while the low incidence countries tend to be non-industrialized. Indeed, the correlation between gross national product and breast cancer mortality rate is 0.72 (Armstrong and Doll, 1975). Although Japan may appear to be an exception since it is an industrialized country with low rates of disease, its population largely consisted of peasant farmers until recently.

An examination of the scale of fat consumption in the data of Carroll reveals some of the problems of data quality using this approach (see Figure 1). The fat consumption estimate for the U.S. is 150 g/day; if this represents 40% of calories, then total energy intake would be about 3400 Kcal per individual, including men, women, and children. A more reasonable estimate of true intake would be 2600 for men and 1800 for women (Beaton et al, 1979). To some extent, therefore, these international correlations probably represent a relationship between food wastage and breast cancer risk.

Other geographic correlations between fat intake and breast cancer risk are less striking. A positive correlation between per capita consumption of dairy fat and breast cancer rates has been noted for geographic areas with in England, but fat intake from other sources was inversely related to breast cancer rates (Stocks, 1970). Within the U.S., regional consumption of milk, an important fat source, is positively associated with rates of breast cancer, although consumption of eggs, a major cholesterol determinant, is inversely related to breast cancer rates (Gaskill et al, 1979).

Migrant Studies

Migrant studies have demonstrated that the large differences in breast cancer rates among countries are not attributable to genetic factors. Buell (1973) observed that the offspring of immigrants from Japan to the United States, but not the immigrants themselves, have breast cancer rates that are similar to those of the general American population. However, Polish women who migrate to the United Kingdom or the United States themselves attain rates of breast cancer that are similar to the higher rates among women born in these countries (Staszewski and Haenszel, 1965; Adelstein et al, 1979), suggesting that the delayed effect among Japanese-Americans may be due to a slower acculturation process. This distinction is potentially important for dietary studies, since an exposure that acts only in childhood but is manifested decades later will be difficult to investigate. While the potential period of susceptibility to dietary fat remains uncertain, it appears clear that large bowel cancer rates increase more rapidly than breast cancer rates within the same migrant populations (Haenszel and Kurihara, 1968), indicating that relationships with adult diet are more likely to be seen for colon cancer.

Special Populations

The rates of breast cancer among special populations who have been consuming unique diets for long periods are of interest since an influence of diet should not be missed due to error in the measurement of individual diets or a limited follow-up period in a cohort study. It was originally reported that, compared to the general U.S. population, breast cancer mortality rates were lower among Seventh-Day Adventists, who consume relatively small amounts of meat and other animal products, (Phillips, 1975). However, it was later appreciated that these differences in mortality rates could largely be attributed to confounding by socio-economic status. Although breast cancer incidence is positively associated with economic status in many countries, breast cancer mortality rates in this instance were inversely related to socio-economic status presumably due to earlier diagnosis and more effective treatment. When compared to a U.S. white population of similar socioeconomic level, breast cancer mortality rates among a large group of Seventh-Day Adventists were only slightly and nonsignificantly lower than expected (SMR = 0.85, Phillips et al, 1980). In striking contrast, the colon cancer mortality rate among the Seventh-Day Adventists was only about half that of the comparison population. Although total fat intake of Seventh-Day Adventists is not particularly low, vegetable fat is largely substituted for animal fat; thus these data do not support the hypotheses that animal fat or meat intake are specifically related to breast cancer.

Kinlen (1982) compared rates of breast cancer among orders of nuns who were either vegetarians or ate only small amounts of meat with rates among single British women; no significant differences were found. Since these women had typically entered their convent before age 20, a contrast in diet had existed for many decades. Although the conclusions of this study were limited by the modest number of cases of breast cancer among the nuns (62) and the limited quantitative data on their diets, this study illustrates the potential value of special exposure groups to evaluate dietary hypotheses. If the rates of breast cancer had been different, however, the interpretation would be difficult because many factors other than fat intake, both dietary and non-dietary, differed between the groups of women.

The very strong correlation between dietary fat intake and breast cancer rates among five ethnic groups living in Hawaii (Kolonel et al, 1981; see Figure 2) has been interpreted by some as evidence of an etiologic relationship. However, an examination of the scale of this figure indicates that a 34% increase in fat is associated with a two hundred percent increase in breast cancer incidence. Although it is possible that dietary fat intake explains some of the differences in rates, the implausibly strong relationship, which is much stronger than suggested by the international correlations, increases the likelihood that the association observed in this study is confounded by some other factor.

INSERT FIGURE 2 HERE

Secular trends

Major changes in breast cancer rates within one country provide further strong evidence that non-genetic factors have an important influence on the occurrence of this disease. For example, dramatic changes in breast cancer incidence have occurred in Iceland during this century (Bjarnason et al, 1974). This increase was primarily in women 45 years of age and older (see Figure 3), which provides evidence to support the hypothesis of DeWaard et al, (1964) that environmental factors differentially affect premenopausal and postmenopausal disease. Since the diet of the Icelandic population changed substantially over that period of time, becoming high in fat composition like other Western countries, these data are consistent with the hypothesis that fat intake causes breast cancer, but do not exclude other possible explanations.

INSERT FIGURE 3 HERE

In Japan, fat intake has increased dramatically since World War II; between 1955 and 1973 per capita fat intake increased more than 150% while total energy intake remained unchanged (see Figure 4). During this period, age-adjusted breast cancer mortality rates increased much less markedly (Figure 5); essentially no increase occurred among women sixty years of age and older, who might be expected to experience the largest effect of an environmental change (Hirayama, 1978; see Figure 6). Incidence rates of breast cancer changed only slightly between 1963 and 1977 (Hanai and Fujimoto, 1982).

Possible explanations of the small changes in breast cancer rates in Japan, despite radical increases in fat intake, are that the diets of women changed less than men, or that diets of older women changed less than younger women. However, the striking increase in colon cancer mortality among Japanese women, which is also hypothesized to be related to diet and affects predominantly older individuals, argues against these explanations. As shown in Figure 5, age-adjusted colon cancer mortality through 1984 has increased almost in proportion to the increase in dietary fat between 1955 and 1973, and is now nearly equal to breast cancer mortality. None of these secular trends have been adjusted for changes in reproductive risk factors; it is likely that some of the small increases in breast cancer are due to later and fewer births. Furthermore, it is difficult to predict future changes; if diet acts primary during childhood, the full effect of the dramatic changes in Japan may not be seen for several more decades.

INSERT FIGURES 4, 5 and 6 HERE

Enig et al (1978) have related consumption of different types of fats to the apparent increase in incidence of breast and other cancers in the United States. They have reported that the strongest association is that with the consumption of trans-fatty acids, which are fatty acids created in processes that convert liquid vegetable oils to margarine and solid vegetable shortening. However, it is not clear whether the U.S. incidence of breast cancer has actually been increasing beyond what would be expected on the basis of a trend toward later and fewer pregnancies.

Famines or other sudden changes in national diets due to war and social upheavals may potentially be useful to examine the latent period between change in diet and change in breast cancer rates. Ingram (1981) used this approach to examine the breast cancer mortality in England and Wales in relation to the marked changes in diet that occurred during World War II. He found positive correlations between breast cancer mortality and intake of meat, fat and sugar, with maximal associations for a lag interval of 12 years. However, the marked differences in breast cancer mortality observed by Ingram appear to be an artifact due to a change in procedures for coding deaths (Keys et al, 1987). Thus it appears that the changes in diet during and after World War II in England had no important effect on breast cancer mortality.

Case-Control Studies

The relationship between fat intake and risk of breast cancer has been examined in relatively few case-control studies. In what has been described (Greenwald et al, 1987) as the most thorough case-control study even nine years after its publication, Miller et al, (1978) compared the diets of 400 Canadian women with breast cancer with those of 400 neighborhood controls. (The abstract of this paper was quoted earlier in this chapter.) Because of the exceptional quality of the data and the prominence this study has received as support for the dietary fat and breast cancer hypothesis, the findings will be examined in detail.

In the study conducted by Miller et al, three methods were used to measure dietary intake. A 24-hour recall was administered to familiarize subjects with the process of reporting food intake; a 4-day dietary record was completed to serve as a standard for validating their diet history questionnaire; and the dietary history questionnaire was completed by an interview that referred to a two-month period six months earlier, with the intent of avoiding any influence of the cancer diagnosis or treatment on the report of diet. In their companion paper (Morgan et al, 1978), the authors state that they "believe that both the 24-hour recall and the four-day diary are inherently less reliable for individual estimates of usual intake, and that when such estimates are required, the diet history should be used." They further appropriately note that in a case-control study there is reason to be concerned that the diagnosis or treatment of cancer could alter diet or its recall; this is additional reason to believe that data based on a 24-hour recall or a diet record collected after the diagnosis of cancer will not be relevant to disease etiology.

Although Miller et al, presented their data in several ways, only the means for cases and controls are shown here. In epidemiologic studies we are ultimately concerned with the change in rates of disease as a function of change in exposure, in this case dietary fats. For this reason, epidemiologists typically divide continuous exposures into categories, use one of these categories as a reference, and compare rates or relative risks of disease for the other categories to those for the reference. Analyzed in this way, it frequently becomes apparent that substantial and important effects of the exposure are present even when the differences in mean values for cases and controls seem trivial. While a thorough analysis will include a display of relative risks according to exposure level, it useful to recognize that these data are derived from the continuous distributions for cases and controls and that comparisons of mean values for the two groups, given that they are approximately normal and have similar variances, can provided a concise and informative summary of the data as well as the most powerful statistical test of a differences between groups. The potential for any systematic error or bias between cases and controls to distort the association can often be best appreciated by comparing means since the difference between their values is frequently within the range of highly plausible degrees of bias.

The primary findings from the study of Miller et al, are displayed in Table 1; although the authors provided information for other dietary lipid fractions, the data for calories, total fat and saturated fat form the basis of their conclusions. It is apparent that the only statistically significant results are for data based on the 24-hour recall, which the authors appropriately believe is likely to be both unreliable (subject to major random error) as well as biased in the context of this case-control study. For their preferred method of assessment, the dietary history questionnaire, the differences between cases and controls are small and not statistically significant, even by their one-sided test. Moreover, the magnitude of the difference in total or saturated fat intake between cases and controls is almost exactly proportional to that for total caloric intake. From these data it can be calculated that the cases reported 39.1% of their calories from fat and the controls 39.0% of calories from fat. For saturated fat, the values are 15.1% for cases and 15.0% for controls. This is not the optimal method to adjust for total caloric intake in an epidemiologic context. However, for variables that are highly correlated with total energy intake the result will usually be very close to that obtained with regression analysis (Shekelle and Nichamen, 1987; Willett and Stampfer, 1987). The optimal analysis would require the original raw data.) Thus, this study actually provides no support for the hypothesis that the fat composition of the diet affects risk of breast cancer; further, it illustrates the potential for bias when collecting information about diet after rather than before the diagnosis of disease.

INSERT TABLE 1 HERE

Although the overall data of the study by Miller et al, do not support the hypothesis that dietary fat increases the risk of breast cancer, it is possible that a positive association exists within a subgroup that is obscured by only examining the total group. Many believe that diet would have the strongest relationships with breast cancer among postmenopausal rather than premenopausal women because the international differences and secular changes within some countries are substantially greater for older rather than younger women. Miller et al therefore examined women separately according to menopausal status (see Table 2). Although none of the differences are statistically significant, the small overall differences in absolute total and saturated fat intake are almost entirely attributable to premenopausal women, in contrast to expectation. For postmenopausal women over the age of 70, the cases actually reported substantially less fat intake than controls (see Table 4 of the original article). For fat as a percent of calories, the direction of the relationship among postmenopausal women was actually slightly opposite to that hypothesized; for total fat, cases reported 38.1% and controls 38.6%, while for saturated fat cases reported 14.6% and controls 14.7%. The authors of this report also provided relative risks for different levels of fat intake. Although some of the relative risks were greater than 1.0 for higher fat intake, none approached statistical significance and no suggestions of any dose-response relationships were observed. Moreover, none were adjusted for total caloric intake which would have reduced the observed associations.

INSERT TABLE 2 HERE

As Miller et al indicated, their dietary history questionnaire, like any other, was less than perfect; this would tend to underestimate or obscure true positive associations. The correlations between their questionnaire and a 4-day dietary record administered in close temporal proximity were 0.27 for calories, 0.31 for total fat, and 0.34 for saturated fat (Morgan et al, 1978). Although these correlations are rather low and could easily account for the failure to observe associations, they probably underestimate the validity of their questionnaire since a 4-day record itself does not represent a good estimate of usual intake.

In summary, this carefully conducted study does not support the hypothesis that the fat composition of the diet is associated with breast cancer incidence. It is reasonable to suggest that observed associations are likely to have been underestimated due to an imperfect measure of exposure. However, it seems inappropriate to conclude that the use of an imperfect measure of diet means that a true association exists when no association, or one that is readily compatible with chance, is observed (see excerpt from abstract at the beginning of this chapter).

Howe (1985) has published an important methodologic paper on the use of dual response measures to improve the estimates of relative risks when both measures are imperfect. Unfortunately, the data used to illustrate his methods were the 24-hour recall and diet history information from the study by Miller et al described above. The very strong imputed relative risks for saturated fat obtained by Howe (5.9 for high versus low intake) has frequently been cited as support for the fat and breast cancer hypothesis.

It will be readily appreciated that these strong relative risks are largely due to the association based on the 24-hour recall, which the original authors appropriately recognized as artifactual. Sophisticated statistical manipulation cannot correct for primary data that are inherently biased.

The largest case-control study to date of dietary fat intake and breast cancer incidence was reported by Graham et al, (1982). Fat intake, estimated with a simple food frequency questionnaire, among 2,024 women with breast cancer was essentially identical to that reported by 1,463 control women attending a hospital for a variety of benign conditions.

All U.S. and Canada studies share the constraint that few women consume a diet with less than 30% of calories from diet with a fat. For this reason the Japanese case-control study of Hirohata et al, (1985) conducted among 212 women with breast cancer and an equal number of each of hospitalized and neighborhood controls is of special interest. In this study, the mean daily total fat intake reported by cases was 51 grams, by hospital controls was 52 and by neighborhood controls was 52. A similar lack of any substantial difference was seen for both animal fat and vegetable fat. A similar absence of association between fat intake and breast cancer risk was observed in a small case-control study conducted in Greece (Katsouyanni et al, in press).

While the published case-control studies of fat intake and breast cancer provide little support for an etiologic relationship, the degree to which they are informatively null is limited by lack of information on the true between-person variation in fat intake in the study populations and, with the exception of the Miller study, the validity of the questionnaire employed.

A number of other case-control studies of breast cancer have contained assorted questions about the use of specific high-fat foods, but were not extensive enough to provided an estimate of total fat intake. One of these studies (Lubin et al, 1981), has frequently been cited as supporting the fat and breast cancer hypothesis. Five hundred and seventy-seven women hospitalized with breast cancer were asked about their frequency of use of eight foods. Apparently as an after-thought, it was decided to obtain similar information from a series of control women. This required hiring a new interviewing staff which then administered the questionnaire at home to the seventy-two percent of the general population sample willing to participate. The associations found for the use of beef, pork, and sweet desserts were striking (see Table 3). If these relationships were truly this strong, one would expect Seventh-Day Adventists or vegetarian nuns to have markedly lower rates of breast cancer and associations for these foods to be obviously apparent in the case-control studies of Graham et al, and Miller et al, and the prospective data described below of Phillips et al, (1983) and Willett et al, (1987). In retrospect, it seems unlikely that these associations can be correct and that they are much more likely to be artifacts of the non-comparable manner in which the data were collected. The findings of this study suggest that adherence to the basic epidemiologic principles of comparability in data collection procedures for cases and controls is not merely a hypothetical issue.

INSERT TABLE 3 HERE

In other case-control studies that included a limited list of foods, Phillips (1975) found a significant association between fried potatoes and the risk of breast cancer in a Seventh-Day Adventist population, but apparently found no association with meat. In an Italian case-control study, Talamini et al, (1984) reported a positive association with intake of milk and dairy products, but not meat. In a French case-control study, Le et al, (1986) found positive associations with the use of cheese and full cream milk, but not with the use of butter or yogurt. In a large case-control study conducted in western Canada, Hislop et al, (1986) found positive associations with the use of gravy, beef, and pork among premenopausal women; among postmenopausal women, the risk of breast cancer was associated only with consumption of pork. In addition to the limitations of the case-control studies that had a reasonably comprehensive assessment of fat intake, these studies do not allow any examination of whether the sporadically observed associations are confounded by total energy intake.

In two other case-control studies, a reasonably comprehensive dietary questionnaire was employed but the data were not analyzed by computing fat intake. Katsouyanni et al, (1986), in a Greek study consisting of 120 cases and 120 hospitalized controls, combined individual foods into food groups, which provides a practically informative result. For both food groups that contribute substantially to fat intake, "meat, fish, eggs" and "dairy products", nonsignificant inverse relationships were seen with risk of breast cancer. These findings were in striking contrast to the strong positive association between the meat food group and risk of colon cancer found in another case-control study conducted by the same group using the same questionnaire and overall design (Manousos et al, 1983). In an Israeli study that utilized a 250-item dietary questionnaire, Lubin et al, (1986) compared the diets of 818 breast cancer patients with those of both a surgical and neighborhood control series. The analysis was conducted by adding the frequencies of all foods containing more than 20% fat (whether this is on the basis of weight or energy is not clear) and divided the sum of these frequencies into four categories. Positive trends with increasing intake of fat foods were seen using both control groups, but only for surgical controls 50 years of age or older was the trend statistically significant. While these results are of considerable interest, the method of analysis does not make maximal use of the data since the frequencies of use are simply added without giving any weight to the amount of fat in the various foods that contain more than 20% fat. Thus, the consumption of olives would count the same as the consumption of beef steak.

Prospective Studies

The potential for biased associations due to selective participation or differential recall of past diet inherent in case-control studies is eliminated in prospective studies of the fat and breast relationship. Thus far relatively few prospective studies have been published, which is largely a function of the cost and time involved in conducting such studies. In a prospective study from Japan based on a very limited number of dietary questions, Hirayama (1978) reported a higher incidence of breast cancer among women consuming meat daily; however, the total number of cases among women who ate meat daily was only 14, which precluded any detailed analysis. Phillips and Snowdon (1983) examined the relationship between meat consumption and mortality due to breast cancer during a 21-year follow-up period of California Seventh-Day Adventists. During this period 186 women died of this disease; the breast cancer mortality rates (per 100,000 person-years) were 47.8 for no use of meat, 58.3 for meat use 1-3 times per week, and 56.9 for use of meat four or more times per week (p for trend = 0.28). These data are of particular value because of the large portion of the population that consumed no meat at all.

The only prospective study reported to date to include a calculation of total fat intake was based on a dietary questionnaire completed by 89,538 registered nurses aged 34 to 59 years in 1980 (Willett et al, 1987). During four years of follow-up, 601 cases of breast cancer were diagnosed among the participants. After adjustment for known determinants of breast cancer, the relative risk of breast cancer among women in the highest quintile of calorie-adjusted total fat intake, as compared with women in the lowest quintile, was 0.82 (95% confidence interval, 0.64-1.05), and for saturated fat intake the corresponding relative risk was 0.84 (0.66 to 1.08, see Table 4). Similar non-significant inverse trends were seen for calorie-adjusted linoleic acid and cholesterol and for the same dietary lipids not adjusted for caloric intake. Furthermore, no evidence of a positive association with meat intake was observed (see Table 5).

INSERT TABLE 4 AND 5 HERE

This study was unique because it included a validation study that provided a measurement of the distribution of fat intake in the study population independent of the study questionnaire. Based on 28 days of diet records completed by 173 participants, the mean values for lowest and highest quintiles of absolute fat intake in this population were 47 and 98 grams per day. Expressed as percent of total caloric intake, the means for extreme quintiles were 32 and 44 percent. Ideally, it would be of considerable interest to examine the effect of fat intake below 30 percent of calories; however, these data suggest this will be difficult in a contemporary general U.S. population since relatively few eat so little fat. Nevertheless, the degree of variation in fat intake with the study population is of interest since it corresponds closely to the current advice to decrease fat intake by one fourth from an average of 40% of calories to 30% of calories, and is therefore sufficient to evaluate the effect of these recommendations. For saturated fat intake, most highly suspected because of the international correlations, the variation in intake was greater; the means of lowest and highest quintiles for absolute intake were 16 and 35 grams per day (a 117% increase from lowest to highest) and in relation to caloric intake were 11 and 17 percent (a 55% increase).

Even if adequate variation in dietary fat exists within the cohort, useful findings will be obtained only if the dietary questionnaire employed can discriminate among individuals. In this case, information on the performance of the questionnaire was provided by the validation study (Willett et al, 1985). Briefly, the correlation between the dietary questionnaire completed at the end of the year of diet record keeping and the average intake from the 28 days of diet records completed by each participant was 0.53 for calorie-adjusted total fat and 0.59 for calorie-adjusted saturated fat.

This degree of validity in measuring dietary fat is certainly far from perfect, but appears to be comparable to many measurements used in epidemiology, such as Quetelét's index. It is thus reasonable to consider how this degree of error could affect the findings. In general, error in the measurement of exposure that is random with respect to disease status will have two implications. One is that the observed relative risk will be closer to 1.0 than the true relative risk and the other is that the observed confidence intervals will be narrower than the true confidence intervals. In this instance, where no significant association was observed, the focus of interest is in the upper bound of the confidence interval. In other words, what is the upper limit of the plausible relative risks that are compatible with the observed data from the study? It is also of interest that the observed relative risks in this instance were less than 1.0, in the opposite direction of the hypothesis. As pointed out by Potter (1987), a correction for measurement error will therefore move the relative risk further from unity; for total fat intake he estimated the corrected relative risk would be approximately 0.6 and 0.7. Statistical methods to correct the observed confidence intervals for measurement error (which includes uncertainty due to the measured error itself as well as uncertainty in the estimation of the measurement error) are not yet published at this time. However, one method (Rosner and Willett, 1988)provides this information based on correction of logistic regression coefficients and their standard errors. Using this method and the data from the validation study, the observed relative risk (adjusted for age, alcohol intake, and calories) for the highest versus the lowest quintiles of saturated fat intake was 0.85, (95% confidence intervals 0.67-1.07), which was corrected to 0.76 (95% confidence intervals 0.50-1.13). Note that the point estimate moved away from one and the width of the confidence intervals increased. The upper bound was still only slightly above unity, indicating that, after accounting for error in the measure of fat intake, the data are compatible with only a very weak positive association. Even if the relative risk was centered on the observed relative risk, it is apparent that only weak positive associations would lie within the expanded confidence interval. Short of finding a significant inverse association, it is difficult for any study to exclude the possibility of a very small positive association. However, it is apparent that the failure of this study to find a substantial positive association between fat intake and breast cancer incidence cannot simply be explained by imperfect measurement of exposure.

It is quite possible, even likely, that the latent period between exposure and disease was not represented in this study since the maximum follow-up time was four years, and that fat intake, therefore, could still influence breast cancer risk. This possibility cannot be eliminated since the latency period for breast cancer is unknown. However, in laboratory animals, dietary fat acts as a promoter, having an effect during the later stages of carcinogenesis (Hopkins et al, 1981). Moreover, even though the follow-up period was limited, dietary intake tends to be correlated over time (Rohan and Potter, 1984), so that the base-line assessment also reflected previous intake over a vaguely defined period of years. This study, however, does not address the possible influence of fat intake much earlier in life, such as during adolescence. Indeed, it is unclear whether the influence of diet composition in youth on risk of breast cancer can be effectively studied in adults since the recall of food intake during that period as an adult has not yet been demonstrated.

It should be noted that the age distribution of the Nurses Health Study cohort was truncated so that the oldest participant was 59 years of age in 1980 when the dietary data were collected. While there appeared to be no suggestion of any positive association between dietary lipid intake and risk of breast cancer in either pre- or post-menopausal women, an association among older post-menopausal women could not be excluded. However, there is no suggestion from any of the case-control studies that a stronger positive association with dietary fat exists among older post-menopausal women; in the study of Miller et al (1978), the direction of the relationship was actually inverse among this group.

The Nurses Health Study illustrates another advantage of a prospective study since it is possible, with additional followup, to examine the relationship of the same dietary exposure data with risk of breast cancer at different latent periods. Thus it will be of considerable interest to know the nature of this association after ten or fifteen years. In addition, repeated dietary questionnaires are being completed by participants at intervals of two or four years so that the effects of recent versus more remote diet can be distinguished with large numbers of endpoints. This information can also be used to examine the relationship between change in diet and change in risk of breast cancer, which has obvious public health implications.

In summary, the case-control and cohort studies that have been sufficiently comprehensive to allow a computation of total fat intake have been remarkably consistent in failing to provide evidence of a positive association between the dietary lipid composition of the diet and risk of breast cancer. Sporadic associations have been observed between meat and dairy products in some case-control studies with a limited dietary assessment. However, these associations have not been consistently observed in these limited studies or the more comprehensive case-control studies, and are inconsistent with the rates of breast cancer in Seventh-Day Adventists (Phillips, 1980) and vegetarian nuns (Kinlen, 1982). Moreover, if true, these positive associations with meat intake should have been readily observable in the prospective studies of Phillips and Snowdon, (1983) and Willett et al, (1987). It is thus most likely that these sporadic findings represent the play of chance combined with a tendency for positive associations to be reported.

Biological Plausibility

Some support for the hypothesis that high levels of dietary fat increase the rate of breast cancer is derived from studies that have related dietary factors to estrogen fractions, which are, in turn, thought to be related to breast cancer risk (Willett and MacMahon, 1984). Among postmenopausal women, omnivores on a high fat diet had higher urinary excretion of estriol and total estrogens (Armstrong et al, 1981) and higher plasma levels of estrone and estradiol (Goldin et al, 1981) than vegetarian women. The relatively low plasma levels of estrogen among postmenopausal vegetarians in the last-cited study were shown to be at least partly the result of greatly enhanced fecal excretion of estrogens.

Feeding a high-fat, Western diet to postmenopausal black South African women who typically consumed a low-fat vegetarian diet caused an apparent decrease in levels of luteinizing hormone, follicle-stimulating hormone, and prolactin (Hill et al, 1980). In this study only a small increase in estradiol level was observed, and other estrogen fractions were apparently not measured. Hagerty et al, (1987) recently conducted a cross-over trial of a high fat diet (46 percent of calories) versus a low fat diet (25 percent of calories) among six women. No effect was seen on plasma or urinary levels of estrone, estradial, or plasma progesterone or prolactin.

Among premenopausal women, inconsistent associations of diet and sex hormones have been observed. Studies among vegetarian and non-vegetarian Seventh-Day Adventist teenagers (Gray et al, 1982) and among teenage girls in four countries with large differences in breast cancer rates (Gray et al, 1982b) found no meaningful associations between plasma or urinary estrogen levels and dietary factors. Although premenopausal American women who were omnivores were found to have higher levels of plasma estrone and estrodiol than vegetarians (Goldin et al, 1981), an apparent decrease in estradiol level was caused by feeding a high-fat, Western diet to premenopausal South African women (Hill et al, 1980). A decrease in fat intake from 35% to 21% of calories among cystic breast disease was

In addition to the possibility of acting through an effect on estrogen metabolism, several other mechanisms have been proposed by which dietary fat may increase the risk of breast cancer. Wynder et al, (1976) have suggested that fat may affect breast cancer risk by altering prolactin secretion. The existence of such a mechanism is supported by some animal studies (P.C. Chan and Cohen, 1974), although it has not been established that prolactin secretion is related to breast cancer in human beings. Another potential mechanism relates to the intake of polyunsaturated fats, which are subject to in vivo peroxidation. Highly reactive radicals generated in this process may damage DNA and other macromolecules, ultimately leading to neoplasia (Ames, 1983). It is of note, however, that the international correlations that underlie the fat and breast cancer hypothesis are based on an association with animal fats, not vegetable fats, which are the primary source of polyunsaturated fatty acids. For example, Japanese diets differ from those in the U.S. in their saturated fat content, but not in the amount of polyunsaturated fatty acids (Insull et al, 1968).

It has also been suggested that dietary fat may be linked to breast cancer through increased caloric intake and the development of obesity. Adipose tissue can convert androstenedione to estrone (Grodin et al, 1973) and thus makes an important contribution to circulating levels in postmenopausal women. However, this would not be an effect of dietary fat specifically, since one can develop excess adipose on a diet that is not high in fat composition.

Construction of a plausible mechanism whereby fat may affect the risk of breast cancer is seriously hindered by our basic ignorance of the pathophysiology of this disease. We do not really understand the steps that lead to breast cancer and lack an established measurable intermediary factor analogous to serum cholesterol or glucose in the case of coronary heart disease. Without an established biochemical or molecular precursor lesion, the search for a mechanism may be premature until it is reasonably established that, indeed, high fat diets increase the risk of human breast cancer.

A Re-examination of the Animal Data

Although the hypothesis that high fat diets cause breast cancer in humans has largely been based on animal studies, the interpretation of these laboratory findings is controversial. This issue cannot be reviewed in detail here, but is discussed at length by Birt (1986) and in the proceedings of a recent symposium (Pariza and Simopoulos, 1986). A central question is whether fat intake has an effect on mammary cancer other than its contribution to total energy intake; this issue is remarkably parallel to that facing epidemiologists.

There is little question that restriction of energy intake dramatically lowers the incidence of mammary tumors. Since fat is uniquely dense in its energy content, a low fat diet will be confounded by a reduction in energy intake unless strict care is undertaken to insure that the available energy intake is held constant. This issue has been studied by Boissonneault et al, (1986), who found, like many others, that rats on a low-fat ad lib diet had lower tumor incidence than those on a high-fat ad lib diet (see Table 6). However, when the high fat diet was restricted so that total caloric intake was about 20% lower than the ad libitum intake, the tumor incidence was reduced by 90%. This issue is further complicated by the finding that the net energy available to living organisms from macronutrients is not strictly proportional to the classical values obtained by bomb calorimetery (4 Kcal per gram of carbohydrate or protein and 9 Kcal per gram of fat). Because more energy is required for the absorption and metabolic processing of carbohydrate and protein, in at least some situations they may provide approximately 20% less available energy than has been used in typical calculations (Donato, 1987).

INSERT TABLE 6 HERE

Albanes (1987) has performed a meta-analysis of diet and mammary cancer experiments in mice conducted over the last 50 years. An extremely strong overall positive association was seen for total energy intake; however, after adjustment fcr total energy intake, the fat composition was actually weakly inversely related to incidence of mammary tumors. In another review of animal experiments, Birt (1986) concluded that evidence did exist for an effect of dietary fat independent of total energy intake. There is clearly not a consensus at present that the total fat composition of the diet influences the risk of mammary tumors, thus the existence of such a relationship cannot be used as an argument that a similar relationship should exist in humans.

A fundamental question related to the laboratory findings is whether any particular rodent model has relevance to human breast cancer. Ironically, this is a difficult issue to prove or disprove without firm human data. In toxicity studies, the anology with humans is more direct since it involves fewer assumptions to presume that different species will respond similarly; even in this situation many exceptions can be found. However, in most studies of diet and cancer in animal models, one is examining the effect of diet on a cancer that is caused by an inducing agent that may be irrelevant to humans.

Using a quite different approach, Sohnenschein et al (1987) have recently conducted a case-control study of breast cancer in dogs by interviewing owners about the usual foods consumed by their animals. Compared to human populations, an extremely wide intake in the fat composition of the diet was observed among these animals that varied little from day to day. Compared with controls having other cancers, and also a series of cancer-free controls, no association was observed with the fat composition of the diet.

Apart from possible effects of total fat intake on the occurrence of mammary tumors in animals, it has been suggested that the fatty acid composition of the diet has an independent relationship with this malignancy. In particular, it has been suggested that polyunsaturated fat may be particularly deleterious (Carroll and Hopkins, 1979; Hopkins and Carroll, 1979). This appears to be inconsistent with human data based on international correlations, case-control studies (Miller et al, 1978) and prospective analyses (Willett et al, 1987). Ip (1987) has suggested that little relationship exists in rodents once the essential requirements for linoleic acid have been met. Karmali (1987) has reported that high intake of omega-3 fatty acids, primarily obtained from marine oils, actually inhibit the occurrence of mammary tumors.

Alternative Hypothesis

The failure of most case-control and cohort studies to confirm the hypothesis that a diet high in total or saturated fat composition increases the incidence of human breast cancer leaves the large differences in breast cancer rates among countries unexplained. Many alternate hypothesis exist, including the differences in intake of selenium and other minerals (Schrauzer et al, 1977), marine oils (Karmali, 1987), alcohol (Willett et al, 1987; Schatzkin et al, 1987) and specific vegetables (Kamiyama and Michioka, 1983; Knox, 1977). Although a combination of these factors may contribute to differences in rates between countries, one alternative explanation for the large differences is that the unequivocal protective effect of energy restriction found in animal studies also applies to humans. More specifically, this hypothesis suggests that energy intake sufficiently restricted in relation to requirements during development so as to reduce adult size will reduce the incidence of breast cancer in humans. This hypothesis has been suggested by de Waard (1975) to explain the low rates of breast cancer in Japan, and Gray et al (1979) have shown that differences in body size can explain a large portion of the variation in national rates of breast cancer. More recently, Micozzi (1985) has used adult height to serve as an index of energy balance during development and examined the correlation between mean national heights and breast cancer incidence rates (see Figure 6); a correlation very similar to that for per capita fat intake was observed.

INSERT TABLE 7 HERE

Within some populations it does appear legitimate to use height as an index of childhood energy balance. For example, the substantial gain in stature by offspring of Japanese emigrants to the United States provides clear evidence that caloric restriction has occurred in Japan (Insull et al, 1968). As not all members of a society are likely to have been equally restricted, the energy-restriction hypothesis would lead us to expect a positive association between height and risk of breast cancer within countries, such as Japan, that have experienced a major secular change in adult height over this century. The positive association between height and breast cancer observed in Greece (Valaoras et al, 1969) and in Holland (de Waard, 1975) may be related to limited energy availability for some girls during periods of social disruption.

The interpretation of height in case-control or cohort studies within countries with a prolonged period of relative affluence is less clear. In the United States, caloric restriction sufficiently severe to limit attained height is likely to be rare so that variability in height largely reflects genetic factors rather than nutritional status during development. Thus it is not surprising that height has little if any association with risk of breast cancer in most Western industrialized countries (Adami et al, 1977; Willett et al, 1985; Waaler and Lund, 1983).

The relationship between measures of relative weight and breast cancer incidence appears to be particularly complex (Willett, 1987b). Among premenopausal women, risk of breast cancer has been inversely related to indices of obesity during adult life and at age 18 (Willett et al, 1985; Choi et al, 1978). This finding, which is seemingly at odds with the earlier detection of breast tumors among thin women (Willett et al, 1985b) or by an association of leanness with alcohol consumption (Willett et al, 1987c). The observation that the irregularity of menstrual periods is greater among women with a higher relative weight (Willett et al, 1985b) is compatible with the hypothesis of Pike et al, (1983) that repeated ovulatory menstrual cycles and the accompanying mitoses of breast tissue increases the likelihood of breast cancer. Among postmenopausal women, a modest positive association has generally been observed between relative weight and risk of breast cancer (Lew and Garfinkel, 1979; Valaoras et al, 1969; Brinton et al, 1979; Helmrich et al, 1983), although a dose-response relationship has not been consistently seen.

The energy-restriction and dietary fat-composition hypotheses are not mutually exclusive and, in the extreme, they may converge. In traditional societies of physically active farmers who experienced chronic parasitic diseases and recurrent bouts of diarrhea and other infections during childhood, it would be difficult to avoid energy restriction on a rice or other staple diet that contained only 10% of calories as fat. Our sedentary life style, relative control of infectious diseases, and ready availability of refined carbohydrates, however, makes it easy to obtain excess energy on diets that we would consider highly fat-restricted, i.e., 20% or 25% of calories as fat. Even if it is true that energy restriction sufficiently severe to limit adult height reduces breast cancer incidence, this is unlikely to provide a practical approach to the prevention of human breast cancer. If energy restriction were more moderate, so that only weight but not height were reduced, the apparent inverse relationship of relative weight and breast cancer during the premenopausal years makes it unclear whether the net impact on breast cancer rates would be to breast cancer rates during the post-menopausal years, the very modest strength of association and relatively limited success of efforts to control obesity make it unlikely that this avenue will lead to a major reduction in this disease.

There are good reasons to reduce intake of animal fat and avoid obesity. However, existing data provide little support for the hypothesis that recommended changes in dietary fat composition or a practically attainable restriction of energy intake during adulthood will lead to a substantial reduction in breast cancer in Western cultures.

Table 1. Mean nutrient intake based on 24-hour recall, 4-day diet record, and diet history questionnaire for breast cancer cases and controls, pre- and post-menopausal women combined. (Data from Miller et al, 1978).

Nutrients and series	Dietary method 24-hour recall	 4-day record	 History
Total calories			
Cases	1697	1805	2280
Controls	1587	1785	2230
Difference*	109	20	50**
(n)†	(396)	(309)	(388)
	($p^+ = 0.01$)		
Total fat (gm)			
Cases	73.2	81.9	99.1
Controls	69.4	80.0	96.6
Difference	3.7	1.9	2.5
(n)	(386)	(309)	(395)
Saturated fat (gm)			
Cases	28.0	32.0	38.3
Controls	26.2	30.3	37.1
Difference	1.8	1.7	1.2
(n)	(383)	(306)	(397)

* Mean difference for matched pairs

** Difference erroneously given as 150 in original table

† Number of pairs

+ One-sided p values

Table 2. Mean nutrient intake based on the diet history questionnaire for breast cancer cases and controls according to menopausal status. (Data from Miller et al, 1978).

Nutrient and series	Premenopausal Women	Postmenopausal Women	Women aged 70 or more years
Total calories			
cases	2373	2170	1614
controls	2339	2115	1996
difference	34	55	-383
(n)	(85)	(210)	(13)
Total fat			
cases	109.4	91.8	58.9
controls	104.2	90.7	71.7
difference	5.2	1.1	-12.8
(n)	(88)	(213)	(13)
Saturated fat			
cases	42.0	34.3	21.9
controls	40.6	34.5	25.2
difference	1.4	0.8	-3.4
(n)	(88)	(214)	(13)

Table 3. Age-adjusted relative risk of breast cancer for various food items categorized by tertiles. (Lubin et al, 1981).

	Level[1]	Cases	Controls	RR	95% CI
Beef	6	87	127	1.53[2]	(1.1, 2.1)
	5	274	301	2.25	(1.8, 2.9)
	1–4	197	397	1.00	
Pork	4–6	320	398	2.16[2]	(1.6, 2.9)
	3	120	181	1.76	(1.3, 2.5)
	1–2	112	246	1.00	
Fowl	4–6	368	621	0.87	(0.6, 1.4)
	3	151	151	1.54	(0.9, 2.5)
	1–2	39	53	1.00	
Fish	4–6	288	438	1.02	(0.8, 1.3)
	3	141	185	1.26	(0.9, 1.7)
	1–2	129	201	1.00	
Eggs	6–5	160	254	0.84	(0.6, 1.2)
	4	293	449	0.88	(0.6, 1.2)
	1–3	105	121	1.00	
Cheese	6	199	310	1.11	(0.9, 1.4)
	5	126	159	1.37	(1.0, 1.9)
	1–4	232	354	1.00	
Creams – full, sour, ice, whipped	5–6	79	120	0.92	(0.7, 1.2)
	4	184	307	0.90	(0.7, 1.2)
	1–3	290	301	1.00	
Sweet desserts	5–6	183	224	1.45[3]	(1.1, 1.9)
	4	189	286	1.26	(1.0, 1.6)
	1–3	176	316	1.00	

[1] Food frequency levels are defined as: 6 – daily, 5 – 4-6 days/week, 4 – 1-3 days/week, 3 – >1 day/month and <1 day/week, 2 – ≤1 day/month, 1 – never. – [2] Test for linear trend, $p < 0.001$. – [3] Test for linear trend, $p = 0.01$.

Table 4 Age-adjusted relative risk (RR) of breast cancer according to quintile of calorie-adjusted intake of total and saturated fat, linoleic acid, and cholesterol

Measurement	(Low) 1	Quintile For Intake 2	3	4	(High) 5	X, Trend (P Value)
Total fat						
No. of cases	145	112	122	110	112	
No. of women	17,841	17,909	17,924	17.929	17,935	-1.57
Multivariate RR*	1.0	0.80	0.88	0.80	0.82	(0.11)
(95% confidence limits)	-	(0.62,1.02)	(0.69-1.12)	(0.63,1.03)	(0.64,1.05)	
Saturated fat						
No. of cases	146	112	126	105	112	
No. of women	17,848	17,910	17,938	17,915	17,927	-1.86
Multivariate RR*	1.0	0.80	0.91	0.77	0.84	(0.06)
(95% confidence limits)	-	(0.63,1.03)	(0.72,1.16)	(0.60,1.00)	(0.66,1.08)	
Linoleic acid						
No. of cases	151	119	103	115	113	
No. of women	17,848	17,875	17,909	17,961	17,945	-1.42
Multivariate RR*	1.0	0.84	0.75	0.86	0.88	(0.16)
(95% confidence limits)	-	(0.65,1.07)	(0.58,0.97)	0.67,1.10)	0.69,1.12)	
Cholesterol						
No. of cases	118	129	119	129	106	
No. of women	17,916	17,935	17,878	17,920	17,889	-0.76
Multivariate RR*	1.0	1.06	1.02	1.07	0.91	(0.43)
(95% confidence limits)	-	(0.82,1.38)	(0.79,1.32)	(0.83,1.38)	(0.70,1.18)	

*The model includes indicator variables for quintiles 2 to 5 of fat intake, age (five categories), a maternal history of breast cancer, a sister with a history of breast cancer, nulliparity, age at first birth <23 years, current smoking, highest quintile for relative weight, history of benign breast disease, postmenopausal status, and alcohol consumption (three categories).

Table 5 Relation of meat eating with incidence of breast cancer among 89,538 women during four years of follow-up (data based on study of Willett et al, 1987)*

	Frequency of use				
Beef, pork, or lamb as a main dish	≤1/wk	1/wk	2-4/wk	5-6/wk	daily or more
Cases	67	186	258	45	33
Total women	11,416	27,301	36,453	8,820	5,305
Age-adjusted RR	1.00	1.21	1.26	0.90	1.05
			X, trend = -0.24		
Beef, pork, or lamb as a sandwich or mixed dish					
Cases	52	141	227	134	31
Total women	8,885	22,903	30,234	22,609	4,920
Age-adjusted RR	1.00	0.98	1.25	0.98	1.00
			X, trend = 0.27		

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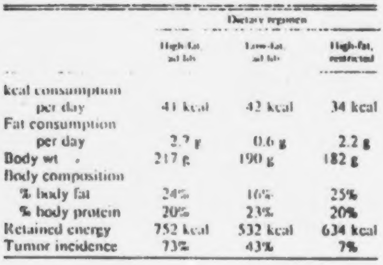
*Numbers add to slightly less than 89,538 due to missing data.

Table 6. Mammary tumor incidence in rats fed a fiet with different fat contents (Pariza and Boutwell, 1987).



	Dietary regimen		
	High-fat, ad lib	Low-fat, ad lib	High-fat, restricted
kcal consumption per day	41 kcal	42 kcal	34 kcal
Fat consumption per day	2.7 g	0.6 g	2.2 g
Body wt	217 g	190 g	182 g
Body composition			
% body fat	24%	16%	25%
% body protein	20%	23%	20%
Retained energy	752 kcal	532 kcal	634 kcal
Tumor incidence	73%	43%	7%

Figure 1 Relation of national per capita fat intake with risk of breast cancer mortality. (reproduced from Carroll, 1975).

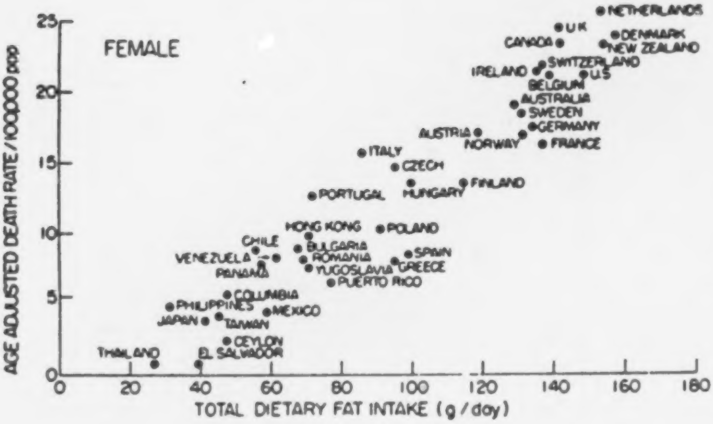


Figure 2 Dietary fat intake of five ethnic groups in Hawaii in relation to age-adjusted breast cancer indicence among women 45 years of age or older. (Kolonel et al, 1981).

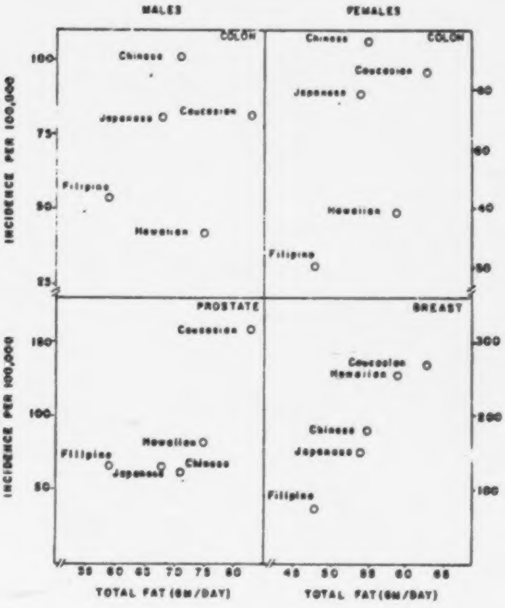


Figure 3 Age-specific incidence of breast cancer in Iceland for the three time periods 1911-1929, 1930-1949, 1950-1972 (Bjarnason et al, 1974).

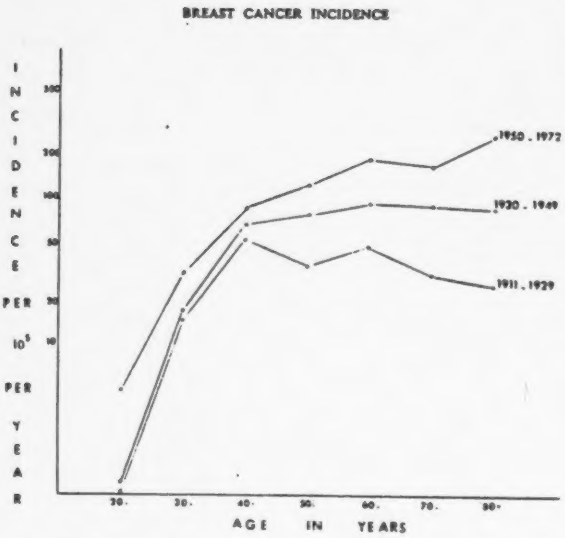


Figure 4 Change in amount of intake of selected nutrients in Japan from 1955 to 1973. (Hirayama, 1978).

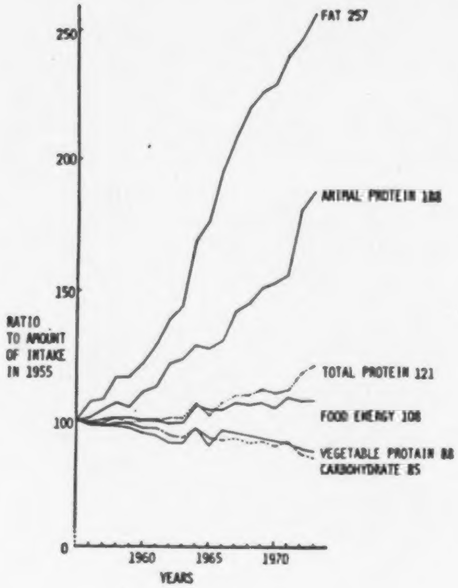


Figure 6 Age-specific death rates for breast cancer among Japanese women (Hirayama, 1978).

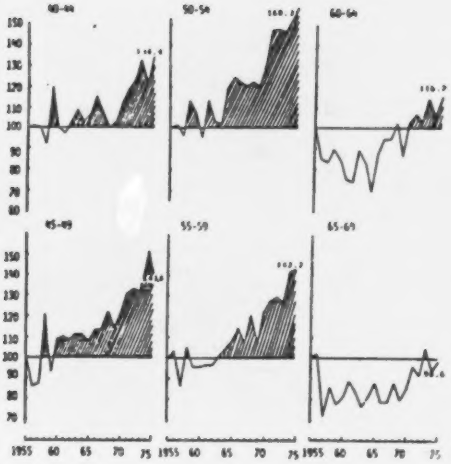
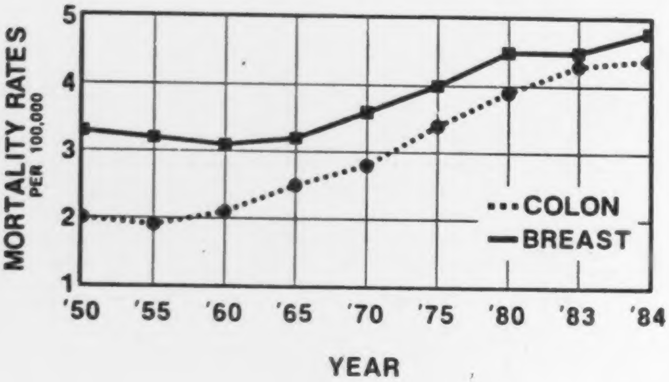


Figure 5. Age-adjusted breast and colon cancer mortality among Japanese women, 1950 to 1984. (Health and Welfare Statistics Association, 1986).
Figure 7 Correlation of average adult height in women with breast cancer incidence for 30 countries (r = 0.8). (Micozzi, 1985).



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TUFTS UNIVERSITY

Contractor For
United States Department of Agriculture
Human Nutrition Research Center on Aging

Office of the Director

April 12, 1988

The Honorable John Glenn
Chairman, Committee on
Governmental Affairs
U.S. Senate
Washington, D.C. 20510

Dear Senator Glenn:

Let me congratulate you and your staff once again for planning and carrying out the stimulating hearing on March 1 on Nutrition and Disease. It is certainly encouraging to scientists to know that you and others recognize the importance of this relationship. I was particularly stimulated by our discussions during and after the hearings about the state of nutrition content in the education and training of physicians. I thought it would be of interest to you to know that we are now down to only four programs in the entire country that are supported by the NIH for postdoctoral training primarily for Human Nutrition and that these programs are not at medical centers. This is a state of affairs which is of considerable concern in the nutrition community and there will be a meeting about nutrition training at the NIH during the third week of June. I might also mention that as a member of the Congressionally mandated National Digestive Diseases Advisory Board, I am aware that that Board has recommended in each of the past two years the funding of nutrition academic awards. These awards were meant to accelerate the transfer of research advances to general medical practice. The long range plan recommended that funds be provided to medical schools to strengthen educational programs for the training of physicians in the latest methods of diagnosis and treatment of digestive diseases and nutrition. The recommendation was for an additional $375,000 to fund five nutrition academic awards annually. I am sorry to say that these awards have not found their way into a somewhat constrained NIDDK budget. I do hope that your interest in nutrition training of physicians will be sustained and I would be happy to discuss this matter with you further at any time.

With this letter I also wish to provide information about the article which I had submitted for the hearing record by Hamish N. Munro of the USDA Human Nutrition Research Center on Aging. His article was entitled "Aging and Nutrition:a Multi-Faceted Problem", and was a chapter from a book entitled "Nutrition and Aging" edited by Martha L. Hutchinson and Hamish N. Munro, published by Academic Press in 1986. This is one of a series of Bristol-Myers Symposia.

Sincerely,

Irwin H. Rosenberg, MD
Professor and Director

AGING AND NUTRITION:

OVERVIEW OF A MULTIFACETED PROBLEM

Hamish N. Munro

USDA Human Nutrition Research Center on Aging
at Tufts, Boston

Running Title: Aging and Nutrition Overview

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I. INTRODUCTION

Interest in geriatric medicine is increasing with the growing awareness of the progressively larger number of adults in this category and their need for medical care (Rowe, 1985). The proportion of people 65 years of age and older currently varies from 5% or less in some underdeveloped countries with a high birth-rate to 16% or more in some areas of Western Europe. Statistical data from the United States collected by Brody and Brock (1985) demonstrate that senior citizens have increased from 4% of the population in 1900 to 11% in 1978 and are projected to approach 14% by the year 2000. The implications of this for health care and for Social Security are obvious.

This introduction to the Bristol-Myers Symposium on Nutrition and Aging emphasizes the variety of problems that have to be resolved in determining the role of nutrition in aging. To introduce some order into surveying the role of nutrition in aging, it is profitable to divide the area into three sections. In discussing these, it will become apparent that senior citizenship is the terminal portion of a continuous process of change in tissue function, disease patterns and nutrient intake which can be identified earlier in adult life when preventative measures may be most effective.

First, many organ functions and metabolic parameters decrease progressively throughout adult life. At the same time, intakes of most nutrients also decline, and this phenomenon may be a factor contributing to the functional losses associated with aging. Second, the incidence of many chronic diseases becomes more frequent as age advances. In a number of these conditions (e.g. cancer, heart disease, hypertension), there is reason to suspect long-term nutritional habits to be contributing factors. Third, the amounts of individual nutrients needed in the diet of old people in order to sustain their health have been inadequately documented. The reduced intake of nutrients noted among middle-aged people as they grow older becomes accelerated in the elderly so that many old people consume smaller amounts of individual nutrients than are recommended for young adults. In most cases, it is not yet possible to demonstrate that such reduced levels of intake increase the age-related loss of tissue function or other aspects of aging among senior citizens. Perhaps more important is whether improved nutrient intakes of the elderly will reduce further loss of tissue function or delay onset of age-related diseases.

II. AGE-RELATED CHANGES IN BODY COMPOSITION AND METABOLISM

As Rowe (1986) points out in this volume, advancing age is accompanied by progressive physiological changes in the functions of most major organs as well as the accumulation of diseases. Furthermore, the severity and clinical manifestations of these physiological and pathological changes are modifed by changes in body composition, diet, exercise and other environmental factors that include smoking and alcohol consumption.

Studies of the effect of aging on body composition are quite extensive, and show that there is a progressive loss of lean body mass throughout middle age and old age, with some tendency for the rate of loss to increase in later life (Forbes, 1976). For example Swedish men lose about 1 kg lean body mass between ages 70 and 75 years (Steen et al., 1979). This loss of lean body mass is largely accounted for by skeletal muscle, which can shrink as much as 40% between the ages of 20 and 80 years (Cohn et al., 1980). This is confirmed by the reduced output of creatinine and of 3-methylhistidine in the urine of elderly people (Munro and Young, 1978) and by other evidence such as a reduced number of contractile fibers in the muscles of old people (Lexell et al., 1983). A striking and important example of age-related change in body composition is osteoporosis which begins in middle age or earlier (Riggs, 1986).

Metabolic changes occurring with aging are also well-documented. In many cases, the alteration in metabolism is best seen in response to a challenge. Thus the fasting blood sugar level is little affected by age, but the response to a standard dose of glucose is impaired to an increasing extent as individuals grow older (Rowe, 1986). Similarly, aging reduces the capacity to metabolize lipids (Kritchevsky, 1979). Protein metabolism is also affected by aging. Albumin synthesis rate was measured by us (Gersovitz et al., 1980) on young and elderly adults at two levels of protein intake. When dietary protein was raised from a low to an adequate level, synthesis rate in the young adults increased, but not in the case of the elderly.

III. AGING AND TISSUE FUNCTION

The most extensive and comprehensive studies of the effect of age on tissue and organ function in man come from the the Baltimore Longitudinal Study on Aging, in which more than 1000 men of various ages have been studied for periods of up to 25 years. This unique cohort thus provides both cross-sectional and longitudinal data on the effects of aging on many physiological functions. The major findings have recently been assembled in book form (Shock et al., 1984). Shock (1972) concludes that the functions of different organs erode progressively throughout adult life at different rates. Thus between the ages of 30 and 80 years, nerve conduction declines 15 percent, cardiac output by 30 percent, renal blood flow by 50 percent, etc. in the average adult man. A second edition of the Handbook of the Biology of Aging (Finch and Schneider, 1985) contains several chapters summarizing changes in nervous system function with aging. The immune system also decreases in functional efficiency with age (Hausman and Weksler, 1985).

Animal models provide the most extensive evidence of dietary effects on the rate of aging of tissues and organs (for review, see Guigoz and Munro, 1985). It has been repeatedly confirmed that rats that are growth-retarded from an early age by caloric restriction live longer, an effect that is still evident if food restriction is imposed on young adult rats. In addition to better survival, almost all tissue functions are retained better as the underfed rat or mouse ages. Skeletal muscle is better preserved, responses of tissues to hormones decline much later due to extended conservation of hormone receptors, and T-cell dependent immunological responses are better maintained. Some of these benefits of dietary restriction also occur when the aging rodent is exercised (Goodrick et al., 1983; Holloszy, 1986).

In addition to the benefits of caloric restriction in preserving function, the incidence of a number of chronic diseases of aging rats is reduced and the time of their onset is delayed by caloric restriction. For example, chronic nephrosis, periarteritis and myocardial degeneration and a variety of tumors are frequent in the older ad libitum fed rat and mouse, but are less significant in the calorie-restricted rodent (Good, 1986).

These studies raise the question of the potential benefits of nutrition, exercise and other environmental variables in diminishing the incidence of chronic age-related diseases and in attaining the maximum human life-span. Fries (1980) has proposed that life-span is determined by two factors. One is the occurrence of chronic disease which shortens the "natural" life-span of the individual. He regards such chronic illnesses as susceptible to some degree of prevention by better life-styles, of which nutrition is an important component. The second factor restricting life-span is classified by Fries as "natural aging", by which he recognizes progressive and inevitable loss of function. Thus, as we learn to eliminate the chronic diseases, the normal life-span of human survival according to Fries will continue until about 80 years of age, after which most people will die from inevitable failure of organ functions at some time between 80 and 90 years of age.

This picture seems incompatible with some other evidence on morbidity and mortality. Thus Katz, et al. (1983) have applied the life-table technique to assess the fate of senior citizens in Massachusetts in two ways: first how many years they are able to operate independently without help, then how long they survive in a dependent state, which is defined as needing help in rising from bed, bathing, dressing and/or eating. Thus, as shown in Table I, men and women aged 65-69 years of age function in an active state for about the same period of time (9.3 years for men and 10.6 years for women). Thereafter, the men survive in a dependent state for a further 3.8 years but the women continue in dependency for 8.9 years, thus accounting for most of the difference in the total life-span of men and women. The criteria for identifying the onset of the dependent phase listed above all relate to the ability to deploy neuromuscular coordination and thus indicate deterioration of the nervous system. On the other hand, statistical studies show that two-thirds of deaths occuring between 80 and 84 years of age and 70 percent from 85 years onwards are due to cardiovascular events, that is, heart disease, cerebrovascular disease and arteriosclerosis (Brody and Brock, 1985). The longer survival of women is probably attributable to their slower development of cardiovascular disease. The role of nutritional factors in the development of atherosclerosis and the potential for retarding the progression of this disease in the elderly is discussed in this volume by McGandy (1986).

IV. NUTRIENT NEEDS AND INTAKES OF THE ELDERLY

Estimates of the nutrient needs of elderly adults are largely extrapolations of the needs of young adults, supplemented by a limited amount of direct experimentation on old people. Actual intakes of nutrients by the elderly have been assessed in various surveys, mostly by recollection of food consumed. The precision of these estimates depends on the care exercised in such studies and, importantly, on having an accurate knowledge of the nutrient composition of the foods consumed. For example, the second Health and Nutrition Examination Survey (Abrahams *et al.*, 1982) provides a valuable view of recent nutrient intakes and nutritional status of a balanced sample of the American population, except that it stops at 74 years, thus excluding the nutrition picture for the older segment most at risk.

There is general agreement that the energy intake of adults diminishes throughout adulthood. Thus, in the Baltimore Longitudinal Study of Aging, cross-sectional data of energy intake showed total daily energy intakes by the men in the survey to diminish steadily from 2700 kcal at age 30 years to 2100 kcal at age 80 years (Shock, 1972). One third of this decline of 600 kcal per day can be accounted for by the reduced basal metabolism resulting from the shrinking lean body mass of older people. The remaining two-thirds represented a progressive reduction in physical activity. This picture is confirmed by longitudinal studies on the same group (Tobin, 1986) and by a number of published studies reviewed elsewhere (Munro, et al., 1986). The Recommended Dietary Allowances (1980) of energy for adult men of different ages are in good agreement with intakes observed in the HANES surveys, but the recommended allowances for adult women of all ages are several hundred calories greater than have been observed to be consumed in these surveys. The low energy consumption of women has been confirmed by direct calorimetry and by using $^{3}H_2{}^{18}O$ dissociation, the latter method being potentially a good direct index of energy expenditure over the whole 24 hours (Prentice et al., 1985).

Since food is consumed in response to a desire for enough energy, the amounts of nutrients associated with various energy sources in the diet are likely to be reduced in proportion to the diminishing energy consumption of aging adults. This is borne out by nutrient consumption data. Thus the intakes of protein (Munro, 1964) and of zinc (Sandstead et al., 1982) are proportional to the caloric intakes of adults. The data of Exton-Smith and Stanton (1965) show that this phenomenon can obtain for old people even over a single decade during which energy intake is falling. They report nutrient intakes of women between the ages of 70 and 80 years living alone; the data show that, over this decade, total energy intake was reduced by 19%, protein by 24%, calcium by 18%, iron by 29% and ascorbic acid by 31%. What we do not know is whether these reductions place the elderly consumer in jeopardy of insufficiency great enough to impair tissue function.

The complexity of deciding on nutrient needs for the elderly is illustrated by the case of folic acid (Munro, 1986). The Recommended Dietary Allowance (1980) for folic acid is 400 μg daily for adults of all ages. However, this has been challenged as being too generous. A survey made in Canada (Nutrition Canada, 1977) showed that elderly men consumed on average 150 µg folate daily, while women received 130 µg, data that are almost identical to those of a Swedish survey (Jagerstad and Westesson, 1979). These low intakes did not result in megaloblastic anemia or in low blood folate levels. In a survey of elderly in New Mexico (Garry, 1986), diet contributed less than 200 µg folate to the average daily intake of this vitamin. Other factors contribute to the assessment of the folate status of the elderly. Thus, achlorhydria, which affects about 20% of elderly, reduces acidity in the proximal part of the small intestine and thus impairs folate absorption; however, overgrowth of intestinal bacteria due to the absence of acidity may compensate by providing additional folate (Russell, 1986). Availability of dietary folate is also impaired by consumption of ethanol and by certain drugs commonly consumed by the elderly.

A major area reflecting the complexity of nutrient needs is the role of nutrition in osteoporosis leading to fracture. The onset of this loss of bone density occurs early in adult life (20-40 years) and in many women accelerates after the menopause, so that they show a higher frequency of fracture than occurs in men of comparable age (Table II). Thus a process starting in early or middle adult life becomes the cause of disease in the elderly, implying that nutrients and other measures applied during the early stages may be most effective in reducing the impact of this important degenerative condition. Factors thought to be involved in promoting bone loss include too little dietary calcium, phosphorus and vitamin D, along with too much protein, phytate and dietary fiber. In addition, insufficient exercise contributes to loss of bone density. The relative merits of these nutrients are discussed in this volume by Holick (1986), Riggs (1986) and DeLuca (1986) and are also reviewed by Munro (1986). Interventions designed to reduce bone loss could include raising the intake of calcium by fortifying the food chain, which is already enriched in the U.S. by the addition of vitamin D_2 or D_3 to milk and margarine. The use of estrogens to retard postmenopausal loss of bone salts and treatment with 1,25-dihydroxyvitamin D are more appropriate for individuals under medical supervision.

V. FACTORS IN THE NUTRITIONAL STATUS OF THE ELDERLY

The elderly provide a more varied spectrum of nutritional status than is encountered in younger groups of adults. This occurs because of social and functional factors affecting the older person. A picture typical of a group at risk for malnutrition is the elderly widow living on a restricted income. She is often socially isolated and may be house-bound by osteoarthritis or other crippling disabilities. Old men living alone are commonly ignorant of the need for a balanced diet, and are liable to show evidence of mild deficiences. In addition to these primary factors that increase the risk of malnutrition, secondary causes of malnutrition in the older population include malabsorption due to a variety of causes, including achlorhydria (Russell, 1986), alcoholism with its substitution of ethanol calories for foods containing important nutrients (Iber, 1986) and the extensive use of therapeutic drugs which interfere with nutrient utilization in various ways (Roe, 1985). In the case of drugs, it may be desirable for the physician to use supplements in order to raise the intakes of certain vitamins whose utilization is impaired by the medicament.

All of these risk factors make it desirable for the physician to include them in an assessment of the health of their elderly patients. Prendergast (1984) provides an extensive program for examining elderly people that includes many of the risk factors described above.

Preventive measures against malnutrition among the elderly include self-administration of vitamin and mineral supplements, a common practice in most communities. For example, in a population of elderly in New Mexico Garry et al. (1982) found that 57% of men and 61% of women were taking supplements, resulting in raising intakes of certain vitamins to several times the Recommended Dietary Allowances. A more rational approach is represented by nutrition intervention programs that provide home-delivered meals or congregate feeding. Kohrs (1986) has evaluated the impact of such programs, which are not limited to nutritional benefits but also provide psychological stimulation, notably for those participating in congregate meals.

TABLE I

ACTIVE AND TOTAL LIFE EXPECTANCY
OF THE ELDERLY

(Katz _et al_., 1983)

	Men (years)	Women (years)
Age group	60-69	60-69
Life expectancy:		
Total	13.1	19.5
Active	9.3	10.6
Dependent*	3.8	8.9

*for rising, bathing, dressing or eating

TABLE II

INCIDENCE OF OSTEOPOROTIC FRACTURE BY 80 YEARS OF AGE IN ENGLISH CAUCASIAN MEN AND WOMEN

(adapted from Nordin, 1980)

Measurement	Men	Women
Cumulative fractures:		
Wrist	4%	14%
Vertebra	4%	8%
Femur	1.5%	5%

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HEALTH
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Living healthy and living long: Scientific research has shown repeatedly that our lifestyle—what we eat and drink, whether we smoke or exercise—affects the length of our life.

In America, the two leading causes of death are heart disease and cancer. Studies by the American Health Foundation and other institutions have shown that prevention is an effective weapon against these diseases, as well as many others. Healthy choices about tobacco use, diet, alcohol and exercise can reduce the risk of heart disease and cancer.

Please read this Health Passport and use it as a reminder that good health is largely the result of a healthy lifestyle. If you follow our suggested guidelines and have periodic medical checkups, you can increase your chances of living a long and healthy life.

Remember: Nobody takes better care of you than you.

Sincerely,

Ernst L. Wynder, M.D.
President
American Health Foundation

ANNUAL HEALTH RECORD

	19( )
Age	
Weight	
Blood Pressure	
Serum Cholesterol	
Physical Examination	
Dental Checkup	
Eye Examination	
Pap Smear (for women only)	
Breast Examination (for women only)	
Aerobic Exercise (average minutes/week)	
Alcohol Use (daily) Oz. of Liquor Glasses of Wine Glasses of Beer	
Tobacco Use (daily) Cigarettes Cigar/pipe Snuff/chew	
Coronary Risk Score (See page 6)	

19( )	19( )	19( )	19( )

CORONARY RISK SCORE*

Calculate your risk for coronary heart disease. Answer each question by choosing the one answer that best describes you. Place your points in the score column. Add up the points and compare your score to the points in the table to determine if you are at low, moderate or high risk.

1) blood cholesterol level

	points	your score
over 300	10	
250-299	7	
200-249	3	
180-199	1	
less than 180	0	_____

2) systolic blood pressure
(For example, use the top number in the ratio: 120/80)

over 160	6	
140-159	4	
120-139	2	
less than 120	0	_____

3) cigarettes smoked daily

2 or more packs	5	
1-2 packs	3	
less than 1 pack	1	
none	0	_____

4) weight (from chart, page 7)

column D answer	6	
column C answer	4	
column B answer	2	
column A answer	0	_____

5) age

60 or older	7	
50-59	3	
49 and younger	0	_____

6) diabetes

you have diabetes	5	
you don't have diabetes	0	_____

RISK SCORE: _____

0-4 = below average or low risk
5-13 = average or moderate risk
14-18 = above average or high risk
19+ = dangerous or very high risk

If you find you are at moderate to high risk, quit smoking, reduce your weight, cholesterol and blood pressure through diet and exercise.

Note: For any score, men have twice the risk of women.

*Calculations from the Framingham Study 26 Year Followup.

HEIGHT/WEIGHT TABLE BASED ON METROPOLITAN LIFE INSURANCE TABLES

WOMEN

Height	Column A (80-100%)	Column B (101-119%)	Column C (120-139%)	Column D (140% and over)
4'7"	less than 94	94-112	113-131	132 & over
4'8"	97	97-115	116-135	136
4'9"	100	100-119	120-139	140
4'10"	103	103-123	124-143	144
4'11"	106	106-126	127-147	148
5'0"	109	109-130	131-152	153
5'1"	112	112-132	133-156	157
5'2"	116	116-137	138-161	162
5'3"	120	120-142	143-167	168
5'4"	124	124-147	148-173	174
5'5"	128	128-152	153-178	179
5'6"	132	132-156	157-184	185
5'7"	136	136-161	162-189	190
5'8"	140	140-166	167-195	196
5'9"	144	144-171	172-201	202
5'10"	148	148-176	177-206	207

MEN

Height	Column A	Column B	Column C	Column D
5'0"	less than 116	116-137	138-161	162 & over
5'1"	119	119-142	143-166	167
5'2"	122	122-145	146-170	171
5'3"	125	125-149	150-174	175
5'4"	128	128-153	154-178	179
5'5"	131	131-156	157-182	183
5'6"	135	135-161	162-188	189
5'7"	140	140-167	168-195	196
5'8"	144	144-172	173-201	202
5'9"	148	148-177	178-206	207
5'10"	152	152-181	182-212	213
5'11"	157	157-187	188-219	220
6'0"	161	161-192	193-224	225
6'1"	166	166-198	199-231	232
6'2"	170	170-203	204-237	238
6'3"	175	175-209	210-244	245
6'4"	180	180-215	216-251	252

Find your weight for your height. A weight in Column A is at or below the ideal. A weight in Column B is considered 1-19% over the ideal. Column C is 20-39% over the ideal. Weight in Column D is more than 40% over the ideal.

Your goal should be to achieve and maintain ideal weight. If your weight is in Column B, C, or D, you should begin a weight reduction and control program involving exercise and diet.

THE IMPORTANCE OF KNOWING YOUR CHOLESTEROL

Each year, more than half a million people die of heart attacks. Most of these deaths could be avoided. Serum cholesterol, along with tobacco use and blood pressure is a controllable heart disease risk factor. Eating cholesterol and saturated fats can raise blood cholesterol levels, causing a buildup in the arteries that can lead to a heart attack.

A simple blood test can tell you your total cholesterol. (For further information, see glossary page 15.)

RECOMMENDATIONS:

- Have your cholesterol level checked.
- Decrease cholesterol and saturated fat intake. (See page 9.)
- Eat more high fiber, low fat, low cholesterol food. (See AHF Food Plan pages 12-13.)
- Choose fruit, vegetables and fish.
- Use less fat when cooking, but when necessary, use monounsaturated or polyunsaturated fat. (See glossary pages 14-15.)
- Trim fat from food before cooking.

AHF CHOLESTEROL GUIDELINES:

Limit fat intake to no more than 30 percent of total calories. An intake of 1800 calories per day should include no more than 60 grams of fat.

Daily cholesterol intake should not exceed 300mg for men and 200 mg for women, or about 100mg per 1000 calories.

COMMONLY EATEN SOURCES OF CHOLESTEROL/FAT*

Food Category

Dairy	**Cholesterol (mg)**	**Total Fat (grams)**
ice cream, 16% fat (1 cup)	87.9	23.8
whole milk (1 cup)	33.2	8.1
hard cheese (1 oz)	29.8	9.4
2% lowfat milk (1 cup)	18.3	4.7
4% cottage cheese (¼ cup)	7.8	2.4
Fat/Oil		
butter (1 teaspoon)	10.4	3.8
mayonnaise (2 teaspoon)	2.7	3.6
oil (1 teaspoon)	0.0	4.5
vegetable shortening (1 teaspoon)	0.0	4.2
margarine (1 teaspoon)	0.0	3.8
Protein		
liver (3.5 oz)	435.0	13.1
egg yolk (1)	288.4	5.9
cheeseburger (4 oz)	106.8	26.1
porterhouse steak (3.5 oz)	93.4	41.9
hamburger (3.5 oz)	93.4	20.2
pork chop (3.5 oz)	92.4	26.2
fried chicken w/skin (3.5 oz)	87.4	21.8
fried fish (3.5 oz)	63.6	6.4
frankfurter (1)	27.4	16.8
cold cuts (2 slices)	23.0	1.8
pizza (1 slice)	19.3	8.9
bacon (2 slices)	12.8	7.4
peanuts (¼ cup)	0.0	18.0
peanut butter (2 Tablespoon)	0.0	16.5
Snacks/Dessert		
chocolate cake (1 slice)	53.4	15.8
apple pie w/no butter (1 slice)	16.0	15.0
french fries (small)	10.0	6.6
butter cookies (2)	7.6	1.7
chocolate candy (1.6 oz)	0.5	16.2
potato chips (1 oz)	0.0	10.0

***U.S. Department of Agriculture**

Recommendations of the American Cancer Society For Early Detection of Cancer*

CANCER:	TEST/PROCEDURE	SEX	AGE	FREQUENCY
COLORECTAL	stool blood test	M-F	50+	every year
	digital rectal exam	M-F	40+	every year
	sigmoidoscopy	M-F	50+	after 2 normal exams one year apart, every 3-5 years
CERVICAL	pap smear	F	20+, earlier if sexually active	after 2 negative, consecutive exams one year apart and then at least every 3 years
	pelvic exam	F	20-40	every 3 years
			40+	every year
UTERINE	uterine tissue sample	F	at menopause	if at high risk
BREAST	breast self exam	F	20+	every month
	breast physical exam	F	20-40	every 3 years
			over 40	every year
	mammography	F	35-39	baseline
			40-49	every 1-2 years as recommended by physician
			50+	every year

***Early detection of breast, cervical or colorectal cancer may reduce death from cancer.**

EXERCISE RECOMMENDATIONS FOR CARDIOVASCULAR FITNESS

The American Health Foundation strongly recommends regular exercise as one part of the lifelong program to maintain a lifetime of good health.

Regular aerobic exercise strengthens the heart and blood vessels, lowers high blood pressure, helps regulate high blood sugar and tones the body while keeping body fat down. Using large muscle groups, such as the legs, in a rhythmic activity, aerobic exercise can keep you fit when performed for at least 30 minutes three times a week. Brisk walking is the ideal aerobic exercise. It requires no equipment and anyone, regardless of age, can do it.

If you are healthy but not active, do not overdo it. Check with your doctor before starting an exercise program, especially if you are 35 or older or may be at special risk for coronary heart disease.

The chart below gives an estimate of the calories burned by an average 150-lb person exercising for one hour.

AEROBIC ACTIVITIES	Calories burned/hr.
Basketball	360-660
Bicycling	240-420
Bicycling (uphill)	500
Cross-country skiing	600
Dancing	240-420
Rowing	250-420
Running (11 min. mile)	540
Skating	350-400
Squash/Handball	600
Swimming	540-660
Tennis (singles)	420
Walking (3 mph)	210
ANAEROBIC ACTIVITIES	Calories burned/hr.
Calisthenics	360
Golf (power cart)	240
Golf (pulling bag cart)	300

AMERICAN HEALTH FOUNDATION FOOD GUIDE

	Dairy	Fats/Oils	Meat/Protein
BEST CHOICE	skim milk: fluid, evaporated or powdered lowfat (1%) milk buttermilk (skim) lowfat (1%) cottage cheese dry curd pot cheese Farmer cheese Sapsago cheese no fat or lowfat yogurt		poultry without skin (white meat) legumes (beans, lentils, peas) egg whites tuna in water fish—boiled, baked, steamed
MODERATE USE	lowfat (2%) & part-skim milk and milk products: yogurt, cottage cheese, farmer cheese, frozen yogurt, ricotta, mozzarella Parmesan cheese feta cheese ice milk sherbert	olive oil soft margarine	lamb, veal lean beef, fat trimmed turkey roll tofu pork ham
LIMIT	whole (homogenized) milk & whole milk products: yogurt, cottage cheese, ricotta, mozzarella cream non-dairy creamers sour cream cream cheese hard cheese ice cream cheese spreads butter	butter lard stick margarine	sausage, bacon, luncheon meat, hot dogs, fried meat, fried fish duck spareribs liver egg yolks heavily marbled beef nuts nut butters

Grains/Starches	Fruits/ Vegetables	Sweets	Beverages
whole wheat/high fiber bread,bagels,rolls, or muffins whole grain cereals/pasta whole grain flat breads brown rice baked potato (with skin) wheat or oat bran, oatmeal, buckwheat, barley	carrots berries apples prunes bananas figs spinach cauliflower Brussels sprouts broccoli squash eggplant	all fruit preserves with no added sugar fruit ices with no added sugar angel food cake	fruit or vegetable juice (unsweetened) club soda seltzer water
tea biscuits or crackers made with butter, margarine, vegetable (including palm/coconut) oil	avocado olives	honey table sugar molasses jams with added sugar hard candy	sweetened carbonated beverages
commercial and "mix" baked goods: doughnuts, croissants, pastries, pies, cakes fried potatoes, french fries fried rice potato chips corn chips granola egg noodles	coconut tempura fried vegetables	chocolate caramel toffee nougat fudge	drinks made with cream or ice cream alcoholic beverages

"Best Choice" foods are low in fat/cholesterol, high in fiber without added sugars.
"Moderate Use" foods are higher in fat/cholesterol, low in fiber with added sugars.
"Limit" foods are very high in fat/cholesterol, very low in fiber, and high in sugar or contain alcohol.

HEALTH GLOSSARY

These definitions are provided to assist you in understanding the Health Passport and how it can help you have a healthier life through exercise, good nutrition, avoidance of tobacco products and a periodic program of medical check-ups.

Aerobic Exercise—Exercise "with oxygen," that is, oxygen is used to produce energy so that the muscles can work over extended periods (22 minutes or longer). Aerobic exercise, for example, brisk walking, swimming, jogging, bicycling, rowing, is recommended to help achieve cardiovascular fitness.

Anaerobic Exercise—Exercise "without oxygen," that is, exercise performed in short, fast bursts so that the heart does not have time to supply oxygen needed for energy by the working muscle. Anaerobic exercise, for example, swimming sprints, running dashes, lifting weights or performing calisthenics, can improve speed and strength but does not necessarily improve cardiovascular fitness.

Alcoholism—Dependence on alcohol to such a degree that it interferes with physical or mental health, personal relations and economic functioning. Consumption of any alcoholic beverage beyond moderate levels is not considered safe. A standard-sized drink of beer, wine or distilled spirits each has equal alcohol content. Each probably has equal risk for promoting alcohol-related diseases.

Blood pressure—Pressure within the blood vessels, measured with a two-number ratio. For example, the ideal blood pressure is 120/80 (systolic/diastolic).

Systolic blood pressure—Measure of the pressure within the blood vessels during contraction of the heart; ideal levels are up to 120.

Diastolic blood pressure—Measure of the pressure within the blood vessels between heart beats; ideal levels do not exceed 80.

Calorie—Measure of potential energy or fuel value of food.

Carbohydrate—Sugar and starch found in fruits, vegetables and grain products.

Sugars include glucose (blood), sucrose (table sugar), lactose (milk), fructose (fruit).

Starches are found in plant matter (flour, bread, potatoes, pasta).

Cholesterol—Fatty substance required by the body to make cell membranes; derived only from two sources, the human liver and foods of animal origin. Cholesterol can be a health risk when it exceeds recommended blood levels, 180 mg/dl for adults and 140 mg/dl for children.

HDL (High Density Lipoprotein) Cholesterol—Form that is transported away from human tissues and excreted.

LDL (Low Density Lipoprotein) Cholesterol—Form that causes damage by depositing cholesterol on artery walls; high LDL levels indicate increased risk of heart disease.

Fat—Most concentrated source of food energy, yielding more than twice the calories per gram as proteins and carbohydrates; fat soluble vitamins A, D, E and K are carried by fatty foods.

Monounsaturated fat—Found in plant and animal foods and thought to lower blood cholesterol; olive oil, for example, is rich in monounsaturated fatty acids.

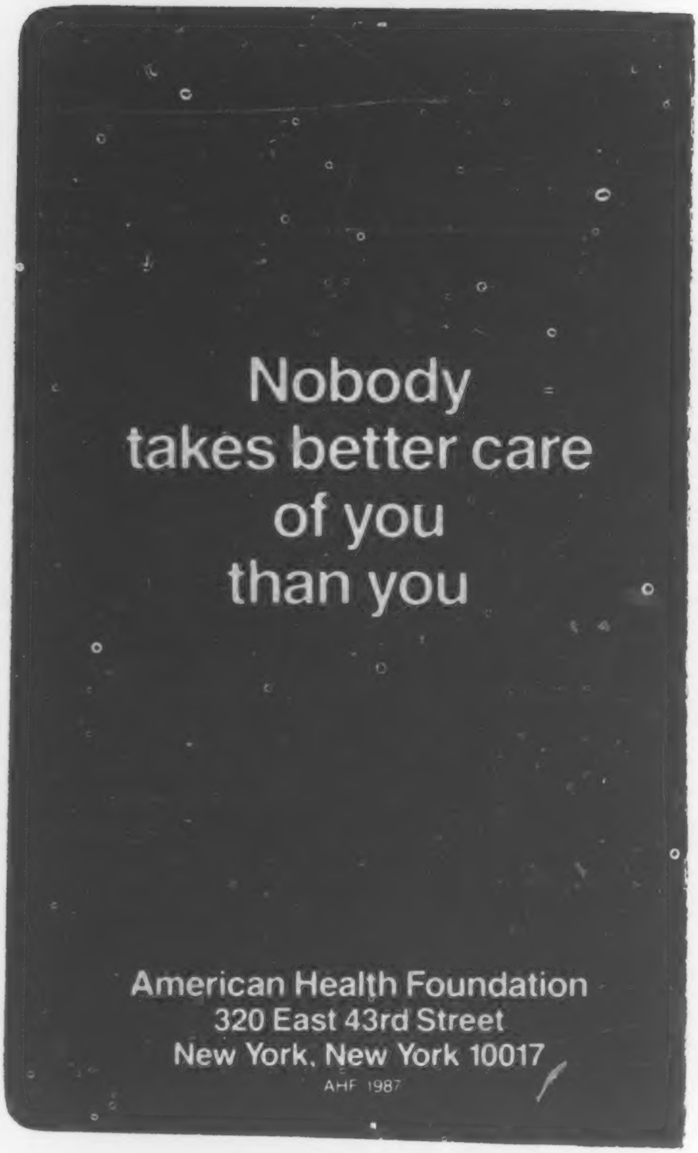
Polyunsaturated fat—Usually of vegetable origin and liquid at room temperature, for example, safflower, corn and fish oils; tends to lower blood cholesterol.

Saturated fat—Usually of animal origin, solid at room temperature, for example, butter, lard and fat in meat, poultry and milk products; tends to increase blood cholesterol.

Fiber—Nondigestible or partly digestible carbohydrates found in grains, cereals, fruits, vegetables and nuts. Some types have been found to be especially valuable in reducing cancer of the bowel; other types seem to reduce high serum cholesterol levels.

P:S Ratio—Numerical relationship between Polyunsaturated and Saturated (P:S) fats in diet; recommended level is 1.0, which usually requires a decrease in saturated fats.

Protein—Source of amino acids necessary to make and repair body parts, such as skin, blood, bone and muscle; and body chemicals, such as enzymes, hormones, hemoglobin and antibodies; recommended low-cholesterol sources include fish, poultry, lowfat yogurt, beans, nuts and lowfat dairy products; high cholesterol sources, which should be limited, include red meat, eggs and cheese.



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CRS REPORT FOR CONGRESS

A NATIONAL NUTRITION MONITORING SYSTEM: BACKGROUND AND BILL REVIEW

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Updated February 23, 1988

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ABSTRACT

Since the Food and Agriculture Act of 1977, Congress has sought the implementation of a comprehensive, coordinated national nutrition monitoring system. The Executive Branch has been working toward the implementation of such a system to include as its primary components the Nationwide Food Consumption Survey and the Health and Nutrition Examination Survey. Beginning in the 98th Congress, legislation has been introduced to mandate a national nutrition monitoring system. This paper outlines the progress made by both the Executive and Legislative Branches toward such a system.

SUMMARY

Since 1977 the Federal Government has been moving in the direction of creating a National Nutrition Monitoring System. In 1978 the proposal for a comprehensive nutrition monitoring system was transmitted from Department of Agriculture (USDA) and Department of Health and Human Services (DHHS) to the Senate and in 1981 the National Nutrition Monitoring System: Joint HHS-USDA Implementation Plan was sent to Congress. Despite stated commitment to and completion of certain activities by the two Departments, a comprehensive coordinated system was not implemented in 1987. Problems have arisen in such aspects as coordination of the two different surveys (NCHS and NHANES) and resources availability. The costs of various current nutrition monitoring activities are provided in this report.

During the last three Congresses, various hearings have been held and bills considered that would mandate a National Nutrition Monitoring System. Congressional attention has focused on the lack of implementation of such a system since it was originally requested a decade ago, the lack of timely data, and the inadequate attention to high-risk groups and certain geographic areas. Companion bills were introduced April 23, 1987, (H.R. 2151 and S. 1081) and are designed to establish a national nutrition monitoring and related research program. The bill would not authorize any new funds to be spent on nutrition monitoring activities.

ROLE OF THE FEDERAL GOVERNMENT IN NUTRITION MONITORING

Nutrition monitoring activities of the Federal Government are carried out in several different departments and agencies. In the past decade, numerous conferences, congressional hearings and reports have sought to review these activities and make recommendations concerning a more cost-effective, comprehensive national nutrition surveillance system. This report will provide a brief review of past and present activities of the Federal Government as well as examine the future of U.S. nutrition monitoring efforts.

Terms frequently used in conjunction with these surveys are identified below.[1]

Nutrition Assessment is a technique designed to provide a preliminary description of the nutritional status of a population relative to those economic, socio-demographic and physiological variables that can affect the nutrition health of a given population.

Nutrition Monitoring entails the measurement and description of changes over time in the nutritional health of a particular population or its subgroups.

Nutrition Surveillance involves those activities directed toward detection of community nutrition problems known to be public health concerns so that appropriate and prompt intervention can be taken.

Nutrition Program Evaluation entails the measurement of both the progress and success in improving the nutritional status of program participants.

Dietary Status is the assessment of the food intake of an individual.

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[1] U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research and Technology. Nutrition Surveillance and Monitoring. Committee Print, 96th Cong., 1st Sess., Washington, U.S. Govt. Print. Off., 1979. p. 7-8.

Nutritional and Health Status is an assessment of the biochemical, anthropometric, clinical and food intake data of an individual.

The Federal Government's involvement in nutrition monitoring can be dated back to 1893 when the U.S. Department of Agriculture (USDA) received the first appropriation to conduct ". . . human nutrition investigations. . ."[2] Since then the Federal Government has performed a number of different surveys that have dealt with food intake, nutritional status, health status and food costs in the United States. Since the 1940s nutrition surveillance has been a subject of increasing concern to national governments, technical agencies, international organizations and health professionals in both the industrialized and developing worlds. Nutrition surveillance is seen as the most effective and practical method for obtaining an overview of the nutritional health of a given population and may help to identify a variety of factors affecting the nutritional health of the population and its individual components.[3]

In the late 1960s the Nation was struck by evidence of hunger and malnutrition in the midst of material abundance and agricultural wealth. A number of events highlighted the problem, including the Poor People's March on Washington, congressional field hearings, the Field Foundation study and the television documentary, Hunger in America.[4] In 1969 then-President Nixon recommended a program to end hunger in America.[5] In December 1969, he convened the White House Conference on Food, Nutrition and Health (WHC) that was to focus national attention and resources on the country's remaining nutrition problems. The questions to be answered included:

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[2] U.S. Office of Technology Assessment. An Assessment of U.S. Food and Agricultural Research System. 1981. p. 114.

[3] U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research and Technology. Nutrition Surveillance and Monitoring. Committee Print, 96th Cong., 1st Sess., Washington, U.S. Govt. Print. Off., 1979. p. 7-8.

[4] Porter, Donna V. Nutrition Policymaking in the U.S. Congress, 1968-1978. Dissertation. The Ohio State University, 1980. p. 162.

[5] Public Papers of the President. Richard M. Nixon. Special Message to the Congress Recommending a Program to End Hunger in America. May 6, 1969. p. 350-354.

- how to insure continuing surveillance of the state of nutrition of U.S. citizens;
- what is needed to improve the status of vulnerable groups;
- how to monitor the continued wholesomeness and nutritional value of our foods and ensure all Americans obtain the most nutritious diet available for their money;
- how to improve nutrition education in schools and for the general public to be better informed on proper food buying and consumption habits.

One panel of the WHC focused on surveillance and evaluation of the state of nutrition of the American people and included among its various recommendations the following points:

- the Secretary of then-Department of Health, Education, and Welfare (DHEW) plan and implement an effective nutrition surveillance and monitoring system linked and cooperating with State, country and local nutrition and health units and with appropriate programs of the Department and other Federal agencies;
- DHEW plan to carry out nutrition surveillance and monitoring aimed at selected target populations and areas, and develop techniques for a continuing monitoring system;
- full and effective provision be made for nutrition surveillance evaluation and education in Federal food delivery programs and in those federally-aided programs that relate to high-risk groups;
- USDA's family, individual and household food surveys be broadened to include coverage and coordination with nutrition and health surveillance, be placed on a 5-year sequence and strengthen related research and outreach programs.[6]

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[6] White House Conference on Food, Nutrition, and Health. Final Report. Section 1 Surveillance and Evaluation of the State of Nutrition of the American People. p. 17-35.

U.S. FOOD AND NUTRITION MONITORING ACTIVITIES

USDA-NFCS

Since 1936 USDA has conducted surveys which provide information on the distribution of food at the household and individual level. These surveys have been conducted about every decade (1935-37, 1942, 1948, 1955, 1965-66, 1977-78 and 1987). The first four surveys included only information on the use of food in households whereas the more recent ones have obtained information both on household food use and on the dietary intake of individual household members. The fundamental purpose of the Nationwide Food Consumption Survey (NFCS) is to measure the food and nutrient content of the diet, the money value of food used by U.S. households and the food and nutrient intakes at home and away by individuals. The objectives of the survey are to link consumers and the food eaten with the nutritional content of their diets and the factors associated with food acquisition, preparation and usage. The survey examines the influences of demographics, social, economic and marketing trends on food choices and subsequent dietary adequacy.[7] Over the years NFCS has provided a comparison of current dietary status and the factors related to current intakes of food and nutrients with changes occurring since the previous survey.

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[7] National Research Council. Food and Nutrition Board. National Survey Data on Food Consumption: Uses and Recommendations. 1984. Coordinating Committee on Evaluation of Food Consumption Surveys. National Academy Press. p. 13-30.

USDA-CSFII

The Continuing Survey of Food Intakes by Individuals (CSFII) was initiated in 1985. It is the first nationwide dietary intake survey designed to be conducted on an annual basis in the United States. CSFII is to provide timely information on the adequacy of the diets of selected population groups and early indication of dietary changes. The core of the CSFII is a national sample of households with women 19-50 years and children 1-5 years in the 48 conterminous States. This core monitoring group was selected because previous surveys have shown women of childbearing age and young children to be most likely to have diets low in certain nutrients. Information in CSFII-85 was collected using one-day dietary recalls only. Subsequent surveys will include men with one-day recalls, while women and children from the core and low income samples will be surveyed on six separate days over a one-year period. The 1985 data were compared to comparable data for individuals of the same age for the 1977-78 NFCS.[8] The CSFII-86 one-day data were compared with one-day data collected in 1985. The CSFII is viewed by USDA as a major component of the National Nutrition Monitoring System.

DHEW-TSNS

Following the late 1960s hunger in America reports and the WHC recommendations for nutrition, the National Nutrition or Ten State Nutrition Survey (TSNS) was conducted from 1968-1970 by the Public Health Service of the then-Department of Health, Education and Welfare (DHEW).[9] The original survey requested by Congress was to be national in scope. However, time and financial constraints led to a more limited survey in which 10 States and New York City were examined, based on a high proportion of poor families, and thus the presumption of a high incidence of nutrition problems in these locations. Data collected were derived from interviews which provided demographic and nutritional evaluations, and medical examinations which provided clinical, anthropometric and biochemical assessments. Despite the limitations of this survey, it set the stage for later developments.

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[8] U.S. Dept. of Agriculture. Nationwide Food Consumption Survey. Continuing Survey of Food Intakes by Individuals. 1986. NFCS, CSII Rept. no. 86-1. 98 p.

DHEW-PNS

The Preschool Nutrition Survey (PNS) was conducted from 1968-1970 under a grant from the then-Children's Bureau of then-DHEW. The study was designed to provide an overview of descriptive data on the nutritional status of a cross-sectional sample of preschool children in the United States.[10] Following studies of preschool children in Mississippi, interviews were conducted in 74 locations which included 36 States and the District of Columbia. Dietary and demographic information along with medical histories were conducted on each of 5300 children. Then each child received clinical examination, dietary assessments and biochemical evaluations.

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[9] U.S. Dept. of Health, Education, and Welfare. Ten-State Nutrition Survey in the United States, 1968-1970. Highlights. DHEW Publ. no. (HSM) 72-8134. 12 p.

[10] Owen, George M. et al. A Study of Nutritional Status of Preschool Children in the United States, 1968-1970. Pediatrics, v. 53, no. 4, Part II Supplement. Apr. 1974. p. 597-646.

DHEW/DHHS-HANES, I, II, AND HISPANIC

Following TSNS, a nutrition component was added to the Health Examination Survey that had been conducted by DHEW since 1956. The Health and Nutrition Examination Survey (HANES) was the first study with a scientifically designed sample to assess the nutritional status of the U.S. population on a continuous basis.[11] The purposes of HANES conducted by the National Center for Health Statistics under the Department of Health & Human Services (DHHS) are to develop information on the total prevalence of a disease condition and descriptive information on it, to provide information on the interrelationships of health and nutrition variables within population groups, to measure the health and nutritional status of the U.S. population and specific subgroups, and to monitor changes in health and nutritional status over time. The surveys have provided estimates of the prevalence of characteristics or conditions in the American population, and normative or descriptive data have been developed. Through successive surveys, repeated collections of these estimates have allowed for an assessment of changes in health and nutritional status. The survey includes examination of physical and biochemical parameters along with nutritional intakes. HANES I was conducted from 1971-1974, HANES II was conducted from 1976-1980 and Hispanic HANES was conducted from 1982-1984. HANES III began in 1988.

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[11] National Research Council. Food and Nutrition Board. National Survey Data on Food Consumption: Uses and Recommendations. National Academy Press, 1984. p. 31-44.

DHHS-CDC-NSP

In 1972, the Centers for Disease Control (CDC) began helping States develop their own nutrition surveillance programs because of implementation problems and the dearth of local data on the nutritional status of vulnerable groups. The thirty-four States that voluntarily participate in the Nutrition Surveillance Program (NSP) collect existing information on low-income children (0-5 years) and low income pregnant women which is routinely obtained at public health clinics and federally-supported nutrition-related programs (particularly the Special Supplemental Food Program for Women, Infants and Children--WIC).[12] The data collected are either analyzed by the States (who have the data processing systems) or sent to CDC for analysis. CDC then aggregates the data from all States, analyzes and reports the nationwide data to each State participating. Primarily heights, weights, hemoglobins and hemotocrit levels are collected to determine the prevalence of growth retardation, overweight problems and possible anemia. Monthly printouts are provided to participating clinics with identification of patients found to have one or more abnormal values.

DHHS-FDA-TDS

In 1965, the Food and Drug Administration (FDA), under DHHS, began the Total Diet Study (TDS). This study is part of a comprehensive annual food surveillance system designed to identify problems and trends relative to dietary intake of pesticide residues and other chemical contaminants for which there may be potential public health problems that warrant changes in either production practice or regulatory policies. Food samples purchased in several locations around the country are shipped for analysis of contaminants and minerals. Through analysis of selected foods, TDS provides information on dietary exposure to harmful contaminants and the adequacy of some trace minerals based on the average daily caloric intake for a given age group.[13] Initially, FDA studied contaminants in the diets of U.S. males age 15 to 25 years. In 1974 some essential minerals were added to the analysis. In 1975 TDS began to analyze diets of six-month olds. Major changes in 1982 increased to eight the number of age groups studied, and streamlined the procedures for food collections and analyses.

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[12] Scheer, J. C. and L. S. Sims. Status of Nutrition Surveillance Activities in 24 States and Metropolitan Health Departments. Public Health Reports. v. 98, no. 4, July 1983. p. 349-355.

DOC-CES

Since the 1880s the Federal Government has conducted surveys of consumer expenditures, savings and income, about every 10-12 years. Since the 1970s the Consumer Expenditure Survey (CES) has been conducted by the Bureau of the Census, under the direction of Department of Labor.[14] About 50,000 households are selected at random to participate in the two parts of the survey. About half of the households participate in a quarterly interview survey which provides information on more expensive items purchased and certain repetitive items such as food and utility costs, along with income and family characteristics. The other half of the sample participates in the diary survey which covers smaller expenditure items such as food, beverages, gas, electricity, gasoline, housekeeping supplies, nonprescription drugs, medical supplies, personal care products and services. The data are used to analyze the consumption patterns of families, to examine and analyze the demand for different products, and to assist families in evaluating their household budgets. The most recent CES was conducted in 1982-83.

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[13] Pennington, J. A. J. and E. L. Gunderson. History of the Food and Drug Administration's Total Diet Study--1976-1987. Journal of Association Officials in Analytical Chemists, v. no. 5, 1987. p. 772-782.

[14] U.S. Dept. of Labor. Bureau of Labor Statistics. Consumer Expenditure Survey. 1986. 193 p.

NATIONAL NUTRITION MONITORING SYSTEM

Although various surveys have been conducted over the years, there has never been an overall plan or coordination mechanism in place to review and integrate the various surveys to assure timely, useful information that systematically answered questions concerning the nutritional status of the U.S. population and its various subpopulation groups. The current nutritional status of the American public is not known. The most recent data collected are from HANES-II completed in 1980, but these data are out of date for policymakers trying to make decisions for fiscal year 1989. The 1986 report of the Joint Nutrition Monitoring Evaluation Committee provided primarily an overview of the 1980 HANES-II and the 1977-78 NFCS data. As the President's Task Force on Food Assistance discovered in 1984, studies of this type require time and the data analysis usually become available long after the urgency which prompted their need has passed. In one of its recommendations, the Task Force called for the Federal Government to take steps to improve information on the nutritional status of Americans.[15] Several other recent reports have included similar recommendations.[16] The original idea for such a system had come from the White House Conference on Food, Nutrition and Health (1969) and was supported by the work of the Senate Select Committee on Nutrition and Human Needs.

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[15] President's Task Force on Food Assistance. (U.S.) Report. Washington, D.C. The Task Force, 1984. p. 110-111.

[16] U.S. Library of Congress. Congressional Research Division. Summary of Reports Concerning Hunger in America, 1983-1986. Report no. CRS 86-791 by D. V. Porter and M. H. Washington, 30 p.

During the tenure (1969-1977) of the Senate Select Committee on Nutrition and Human Needs, the panel investigated not only the extent to which hunger existed in the United States and how it might be addressed, but also how effective the Federal Government was in measuring the problem. Because of problems identified by the Select committee with the existing nutrition surveys (NFCS and HANES), the need for a coordinated comprehensive national nutrition monitoring system was identified.[17] The same conclusion was presented in several other reports prepared by GAO (1977), OTA (1978), OSTP (1977) and the President's Reorganization Project (1978).

The Food and Agriculture Act of 1977 (P.L. 95-113) mandated the Secretaries of Agriculture, and Health, Education, and Welfare to formulate and submit to Congress a joint proposal for a comprehensive nutrition monitoring system. The proposal was to provide for coordination of existing activities and contain recommendations for any additional authorities necessary to achieve a comprehensive monitoring system. The actual language is contained in figure 1. Similar language was contained in the Senate Appropriations Committee Report of the same year (figure 2).

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[17] U.S. Congress. Senate Select Committee on Nutrition and Human Needs. Towards a National Nutrition Policy. Committee Print. 94th Cong., 1st Sess., 1975. 67 p.

FIGURE 1. P.L. 95-113
Food and Agriculture Act of 1977
Nutritional Status Monitoring

Sec. 1428(a) The Secretary and the Secretary of Health, Education, and Welfare shall formulate and submit to Congress, within ninety days after the date of enactment of this title, a proposal for a comprehensive nutritional status monitoring system, to include:

(1) an assessment system consisting of periodic surveys and continuous monitoring to determine: the extent of risk of nutrition-related health problems in the United States, which population groups or areas of the country face greatest risk; and the likely causes of risk and changes in the above risk factors, over time;

(2) a surveillance system to identify remediable nutrition-related health risks to individuals or for local areas, in such a manner as to tie detection to direct intervention and treatment. Such a system should draw on screening and other information from other health programs, including those funded under titles V, XVII, and XIX of the Social Security Act and section 330 of the Public Health Service Act; and

(3) program evaluations to determine the adequacy, efficiency, effectiveness, and side effects of nutrition-related programs in reducing health risks to individuals and populations.

(b) The proposal shall provide for coordination of activities under existing authorities and contain recommendations for any additional authorities necessary to achieve a comprehensive monitoring system.

FIGURE 2. Senate Appropriations Committee Report
Senate Report No. 95-283
June 21, 1977
Nutritional Status Monitoring

The Assistant Secretary for Health is directed to submit to the Committee, within ninety days after the enactment of this Act, a proposal for implementing nutritional status monitoring system, to include:

> An assessment system consisting of periodic surveys and continuous monitoring, to determine the extent of risk of nutrition-related health problems in the United States; which population groups or areas of the country face greatest risk; and the likely causes of risk and changes in the above risk factors over time;
>
> A surveillance system to identify remediable nutrition-related health risks in individuals or local areas, in such a manner as to tie detection to direct intervention and treatment. Such system should draw on screening and other information from other health programs, including those funded under titles V, XVIII, and XIX of the Social Security Act and section 330 of the Public Health Service Act; and
>
> Program evaluations to determine the adequacy, efficiency, effectiveness, and side effects of nutrition-related programs in reducing health risks of individuals and populations.

The proposal shall be developed in consultation with the Department of Agriculture and shall coordinate current activities of the National Center for Health Statistics, the Center for Disease Control, the National Institutes of Health, the Medicaid Early and Periodic Screening, Diagnosis and Treatment Program, and the Bureau of Community Health Services. The proposal shall specify what additional authorizations or funds are necessary to implement the three components described above, as well as other activities deemed necessary for an adequate system.

The Proposal for a Comprehensive Nutrition Monitoring System was completed in March 1978 and transmitted to the President of the Senate in May 1978. The proposal reviewed current activities of Federal, State and local agencies in the areas of nutrition and dietary status assessment, nutritional quality of foods, dietary practices and knowledge, and the impact of nutrition intervention programs.[18] The document also reviewed existing gaps in these activities and proposed the changes needed. The proposal examined not only the HANES and NFCS, but also other existing surveys that could be part of a coordinated comprehensive effort. At that time the proposal indicated that the funding needs of DHEW alone for such a system were estimated to be $32.45 million. While the proposal outlined the components and type of data to be collected and the research needed to support such a system, the document failed to describe how the plan would be carried out. The proposal lacked:

- a set of priorities;
- assignment of tasks and a timetable for completion;
- a prospective plan;
- a reporting component to monitor progress of NSMS;
- timetables for publications;
- assignment of responsibility for implementation;
- identification of costs, commitment to funding or incorporation into the Federal budget; and
- identification of the relationship to the OSTP Joint Subcommittee on Human Nutrition Research.

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[18] U.S. Depts. of Agriculture, and Health, Education and Welfare. Proposal: A Comprehensive Nutritional Status Monitoring System. Mar. 6, 1978. 37 p.

Therefore, the proposal was returned to the agencies with a congressional directive to provide an implementation plan with specific information on how, when, and at what cost the system would be implemented.

In the fall of 1981, the National Nutrition Monitoring System: Joint HHS-USDA Implementation Plan was completed and submitted to Congress. The Implementation Plan contained a description of the activities to be accomplished in preparation for a coordinated system and a calendar of critical features to the implementation activities needed to be performed in order to achieve a comprehensive system by 1987.[19] Since 1981 the two Departments had repeatedly stated their commitment to nutrition monitoring, and some progress has been made. For example, both surveys now use the same nutrient data base, the same age groups and the same 20 variables are examined. However, certain critical features identified in the implementation plan that needed to be completed before the first coordinated survey could be conducted have not yet taken place, delaying the coordinated survey from beginning in 1987. Table 1 provides a description of the critical events, date of completion and actual status.

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[19] U.S. Depts. of Health and Human Services, and Agriculture. Joint Implementation Plan for a Comprehensive National Nutrition Monitoring System. Aug. 19, 1981. 57 p.

TABLE 1. Joint Implementation Plan for National Nutrition Monitoring System, 1981 Calendar of Events

Year	Month	Event	Status
1976-80		National Health and Nutrition Examination Survey II (NHANES II) conducted on a representative sample of the civilian, noninstitutionalized U.S. population, ages six months to 74 years, comprising over 20,000 persons.	Data collection completed in 1980. Data analysis completed and all data released by 1984.
1977-78		Nationwide Food Consumption Survey included a probability sample of the 48 conterminous States, samples of Alaska, Hawaii and Puerto Rico, and special samples of elderly and low-income households.	Data collection completed in 1978. Data analysis essentially completed.
1981	(October)	Appointment of NFCS-NHANES Coordination Committee by ASFCS-USDA and ASH-DHHS, from DHHS, USDA, other Federal agencies concerned with monitoring, and users of survey data outside the Federal Government. The committee will recommend survey designs for NFCS and NHANES that are coordinated to the maximal extent possible.	Coordination Committee set up in 1981. Committee members deferred to statisticians to report on feasibility of combining/coordinating work of surveys; report completed in September 1982.
1981	(November)	Appointment of a DHHS-USDA Joint Nutrition Monitoring Evaluation Committee (JNMEC) by ASH-DHHS and ASFCS-USDA.	Committee appointed October 1983, and held first meeting December 1983; delayed 2 years due to charter preparation.
1981-82		Study of longitudinal measures of individual intakes to test alternative methods for collecting dietary intakes of individuals at intervals up to a year. To be conducted by HNIS, USDA.	Completed
1982	(September)	NFCS-NHANES Coordination Committee to forward completed report and recommendations to ASFCS-USDA and ASH-DHHS.	Letters from separate agencies to Congress on progress in system implementation; no formal report prepared.
1982		Longitudinal study of the effects of infant feeding practices on morbidity and growth in the first year of life. To be conducted by HNIS in consultation with FNS of USDA and coordinated with appropriate units of DHHS.	Cancelled by OMB which declared it unnecessary.

TABLE 1. (continued)

Year	Month	Event	Status
1982	(January and July)	Monitoring Data Users Conferences to be sponsored by DHHS and USDA. Participants to include data users in Government, academia and industry.	Users meeting and subsequent conference were held respectively in July and December 1983.
1982-84		Hispanic Health and Nutrition Examination Survey (HHANES) to be undertaken; it is anticipated that 12,000-15,000 Hispanics in selected locations will be examined over 24-30 month period beginning July 1982.	Data collection completed December 1984. Data analysis completed and released in spring 1988.
1983-84		Field test best methods for collecting dietary data on individuals. HNIS, USDA.	Completed
1983-84		Field test best methods for determining household food losses. HNIS, USDA.	Completed
1984	(November)	Completion and forwarding to Congress of first Joint DHHS-USDA report on Federal nutrition monitoring activities.	Promised to Congress for November 1985, but was actually sent in July 1986.
1984-85		Longitudinal individual intake survey, replacing individual portion of decennial NFCS, USDA. To be conducted by HNIS.	First continuing survey for individual intakes conducted in 1985.
1984-85		To resolve methodologic problems, DHHS and USDA will conduct a joint pilot study in two locations to test maximal coordination of NHANES and and NFCS.	Joint pilot study on methods never implemented.
1987		Conduct of first coordinated NFCS-NHANES survey.	NFCS begun in 1987. Failure to request funds in 1985 budget for preliminary work on HANES III leads to delay until 1988 of HANES III implementation.

In a report completed in September 1982 on the feasibility of coordinating the two surveys, the overall conclusion drawn by the statisticians was that it would be impractical to combine the two surveys in such a way as to collect reliable data that would meet the needs of both agencies and the public.[20] The impediments to a merger were:

- the respondent burden would be excessively large;
- the time schedules for the two surveys were incompatible; and
- the sample design configurations of the two surveys needed to be different to serve the specific purposes of each survey.

The report indicated that any cost savings would come at the loss of information, inability to make correct interences with data and the likelihood of passing on damaging talse information to the public. The advantages of having two surveys were seen to be: that the different samples can address the different goals of each survey most efficiently; and that the small overlap of the two surveys could be used to cross-validate the results of both surveys or as a tool to identify biases that may exist in one design or the other.

Recommendations to better coordinate the separate surveys included:

1. providing for overlap of the two surveys in socio-economic data and individual dietary data;
2. development of definitions, terms, groupings, tabulations, etc., which would facilitate comparability of the output from the two surveys; and
3. development of the schedule and design of the Individual Monitoring Survey to be carried out by USDA, with the HANES III schedule and design.

This coordination was viewed by the statisticians as enabling each survey to use a more efficient design to meet its own goals while introducing comparability to information from the two surveys.

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[20] U.S. Dept. of Health and Human Services. Review of Technical Issues Surrounding the Coordination of NHANES and NFCS. Sept. 23, 1982. 9 p.

In letters of late 1982 and early 1983 from DHHS and USDA respectively, the Congress was informed of the activities and progress made related to the Joint Implementation Plan for NSMS. The letters reported that the following activities were being accomplished (figure 3).[21] [22] However, it is possible to see how these events failed to meet the schedule proposed to achieve a 1987 coordinated system.

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[21] Letter to Honorable Doug Walgren from Edward N. Brandt, Jr. MD. Asst. Sec. for Health, DHHS, Nov. 29, 1982.

[22] Letter to Honorable Doug Walgren from Esther Winterfeldt, PhD. Administrator, Human Nutrition Information Service, USDA, Jan. 5, 1983.

FIGURE 3. Progress Report on Nutrition Monitoring Activities, 1982

o The membership of the Joint Nutrition Monitoring Evaluation Committee has been selected. A proposed charter for the Committee has been submitted to the General Services Administration as specified in the Federal Advisory Committee Act. This committee is to aid DHHS and USDA in developing periodic reports to Congress on the nutritional status of the population and to make recommendations for improvements in the NNMS.

o The proposal for a NHANES Data Users Conference is being reviewed. It is anticipated that the Users Conference will be held by fall 1983. Users from government agencies, academia, and business will be asked to develop recommendations on how to better meet needs for data on nutritional and health status. The recommendations will be used to define better publication vehicles and content, to identify research and methodology needed to support effective collection, analysis, and dissemination of data, and to aid in planning future studies.

o The Hispanic Health and Nutrition Examination Survey began in July and is expected to be completed by December 1984. Examining has been completed in San Antonio, Houston, and Midland, Texas and in Greeley, Colorado. Over 2,000 persons have been interviewed. The data processing is being done concurrently with data collection, a significant improvement over past surveys.

o The National Center for Health Statistics (NCHS) has held its first data users conference for the National Natality and Fetal Mortality Surveys' data which have become available for analysis. The analyses will provide information on maternal health, prenatal and postpartum visits, and infant hemoglobin levels. The FDA/NHANES data users meetings continue to attract a broad representation of users from government agencies, academia, and business. The last meeting was held in October 1982; the next is scheduled for February 1983.

o The Division of Health Examination Statistics, NCHS, has submitted reports on NHANES II dietary intake and nutritional biochemistries for publication. Publications are being developed collaboratively with NIH on diabetes and serum lipid data; FDA and NCHS are working on analyses relevant to food fortification issues with respect to iron, zinc, and folic acid.

o Thirty-one States are now participating in the Centers for Disease Control Coordinated Nutrition Surveillance System, up from 27 States in June.

o Pregnancy nutrition surveillance is currently under way in 21 States, up from 16 States in June.

FIGURE 3. (continued)

o Plans are being explored by the Nutrition Division in CDC's Center for Health Promotion and Education (CHPE) to expand activities into surveillance of the prevalence of nutrition-related and other behavioral risks and conditions among adults, and other high risk populations.

o The Nutrition Division of CHPE is also examining ways to monitor nutrition-related mortality and morbidity.

o The FDA continues its work with respect to food consumption patterns and nutrient content of foods as related to disease prevalence and the quality of the food supply. The Total Diet Study, Food Label and Product Survey, Usage of Vitamin and Mineral Supplements study and other projects are ongoing monitoring efforts.

o FDA has continued to accomplish a surveillance and compliance program on infant formulas to assure that products which are marketed meet the requirements of the Infant Formula Act of 1980.

o To meet the requirements set forth in the Agriculture and Food Act of 1981, section 1329, and section 17(c) of the Food Stamp Act of 1977, a contract was awarded to undertake a Pilot Study of Individual Food Intakes of the Low-In Population. Field work should be underway by late spring or early summer.

o Field work is now underway on the Exploratory Study of Longitudinal Measures of Individual Food Intakes. The general objective of this study is to test alternative methodologies for collecting data on dietary intakes of individuals at intervals during a period of up to 1 year.

o Work has been initiated under a contract with the Food and Nutrition Board for the development of nutritional standards at three or four different levels of risk that may be used to evaluate the adequacy of diets as reported in dietary surveys of individuals.

o Two new sections of Agriculture Handbook No. 8 (Breakfast Cereals, AH-8-8; and Fruits and Fruit Juices, AH-8-9) have been released. Several more sections are nearing completion. In addition, several contracts have been initiated to obtain the composition of those foods for which we have little or no data.

o The plans for a survey of nutrients added to the food supply through fortification were submitted to OMB for review.

In 1984 the Food and Nutrition Board of the National Research Council published its report from the two users meetings on national survey data on food consumption to facilitate wider application of the resulting survey data. The report included the following recommendations concerning the NFCS and HANES, made to the respective agencies which administer the surveys:

- the present system of two separate surveys should continue;
- the two surveys should continue to collect dietary intake data but with a common, identical methodologic core in both surveys to be developed and implemented;
- the two surveys should be better linked through compatible sampling and common population descriptors;
- NFCS Individual Dietary Intake component and NHANES should be redesigned to ensure timely data release and reporting;
- NFCS should continue to collect replicated data on food consumption and dietary intake of individuals;
- a continuous evaluation process for the updating of design and methods for the surveys should be implemented.[23]

More extensive information is provided in the summary recommendations of the report.

Two other studies completed by the Food and Nutrition Board examined food consumption surveys. In the first study done for the FDA, FNB was charged to study the sources of data on food consumption and suggest a system for integrating those data with data on nutrition and health status.[24] The purpose was to elevate current means of determining food consumption patterns and nutritional status and devise alternative methods for obtaining information on food consumption, food consumption patterns and nutritional status. The committee recommended that an ongoing system be developed and implemented with continuous collection, processing and review of food intake data and the collection of health data from currently available sources, and that the data from each be collated for analogous population strata. The second study focused on establishing criteria reflecting the degree of risk associated with adequate intakes of various nutrients and the evaluation of the proportion of dietary intake derived from various caloric sources. The committee recommended the application of the probability approach to interpretation of observed intakes with the use of statistical procedures that take into account the effect of day-to-day variation in nutrient intake within an individual.[25]

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[23] National Research Council. Food and Nutrition Board. National Survey Data on Food Consumption: Uses and Recommendations. National Academy Press. 1984. 133 p.

[24] National Research Council. Food and Nutrition Board. Assessing Changing Food Consumption Patterns. National Academy Press, 1981. 284 p.

In 1986, the first progress report from the Joint Nutrition Monitoring Evaluation Committee was sent to Congress. The report contained information on nutritional status of the U.S.population and made recommendations on the monitoring system.[26] The committee reported that the principal nutrition-related health problems experienced by Americans arise from over-consumption of certain food components: fat, saturated fatty acids, cholesterol and sodium. According to this report, about 28 percent of the U.S. population 25-74 years are overweight; this is especially true among the poor for whom many health problems are related to obesity. Intakes of iron and vitamin C are low in certain groups and the relatively low intake of calcium was identified as a concern in light of current attention to osteoporosis. In addition to the review of available data, the committee made several recommendations on how to improve nutrition monitoring efforts to ease the severe limitations on current data about the nutrition status of the U.S. population (figure 4). The recommendations to improve monitoring are similar to some provisions included in the language of the National Nutrition Monitoring and Related Research Act (H.R. 2151 and S.1081) introduced in the 100th Congress. Work on the second 1989 nutrition monitoring evaluation has already begun.[27] A joint letter describing the status of various nutrition monitoring activities was sent to Members of Congress in April 1987.[28] A review of the activities cited in the letter are contained in figure 5.

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[25] National Research Council. Food and Nutrition Board. Nutrient Adequacy. Assessment Using Food Consumption Surveys. National Academy Press, 1986. 146 p.

[26] U.S. Depts. of Health and Human Services, and Agriculture. Nutrition Monitoring in the United States. A Progress Report from the Joint Nutrition Monitoring Evaluation Committee. DHHS Publ. no. (PHS) 86-1255. 356 p.

By 1987, the Departments published an operational plan for the National Nutrition Monitoring System, a revision of the 1981 Joint Implementation Plan. The operational plan describes the goals of the operational phase, progress during the implementation phase (1981-1986) and proposed activities for the operational phase (1987-1996), including a calendar of events (table 2).[29] However, the operational plan does not provide a clear indication of the date for implementation of the comprehensive, coordinated system sought by the Congress. It does not indicate a) the resources needed, b) a commitment to request funds to implement the current or future activities, c) the responsible agency for each activity, d) specific dates when the various activities will be completed, e) plans for methods research, f) nutrition monitoring activities of agencies other than HANES and NFCS, or g) a comprehensive, sequential and integrated plan. Given the lack of legislative mandate to establish such a system and the current budgetary dilemmas of the Nation, it is unclear how this operational plan will be any more successful than the 1981 Implementation Plan was.

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[27] U.S. Dept. of Health and Human Services and Agriculture. Scientific Review of National Nutrition Monitoring System Information and Data. Announcement of Study; Meetings, Federal Register, v. 52, no. 229, Nov. 30, 1987. p. 45504-6.

[28] Joint letter to Honorable E. de la Garza from Suzanne A. Harris, Deputy Assistant Secretary, USDA and J. Michael McGinnis, Deputy Assistant Secretary, DHHS, Apr. 14, 1987.

[29] U.S. Dept. of Health and Human Services, and Agriculture. Operational Plan for the National Nutrition Monitoring System, Aug. 1987. 47 p.

FIGURE 4. Recommendations in 1986 JNMEC Report

The committee was charged with issuing recommendations to improve the National Nutrition Monitoring System. The committee made 14 such recommendations. Their implementation is the responsibility of USDA and DHHS. The recommendations are categorized into four broad areas:

Improve Information Exchange Between Data Users and Gatherers

o Establish a mechanism for learning more about the data of users, especially Federal agencies. The committee recommends development of an inventory of Federal Government programs affecting nutrition and an annotated bibliography of evaluations of these programs to determine the contribution of National Nutrition Monitoring System data to program design and evaluation.

o Sponsor periodic conferences related to survey design and data analysis.

o Increase the availability of nutrition information from Federal surveys by publicizing Federal reports in professional journals and of computerized bibliographic data bases on nutrition and health.

o Establish a listing of data bases, including methods and techniques, related to food, nutrition, and health. National surveys, special-purpose surveys, and surveys conducted at State and local levels should be included.

Increase Use of Data Collected Under the National Nutrition Monitoring System

o Provide resources for policy-relevant analyses of existing data.

o Provide more complete and uniform documentation of data files available to the public.

o Improve comparability of data from all national surveys conducted as part of the National Nutrition Monitoring System.

o Provide resources to improve the timeliness of release of data tapes and publication of survey results.

Improve Methods and Techniques for Gathering Information for Assessing Nutritional Status

o Continue and expand efforts to study the factors that influence food intake and nutritional status, especially of high-risk groups.

FIGURE 4. (continued)

o Improve coverage of the low-income population in activities of the National Nutrition Monitoring System.

o Evaluate the feasibility of developing nutrition indicators for monitoring changes in food consumption and nutritional status. These might be viewed as analogous to leading economic or environmental indicators and could be the basis for anticipating potential nutritional status problems.

o Increase research to improve methods for assessing dietary intake and nutritional status. Special attention should be given to identifying and reducing sources of inconsistency and error.

Increasing Resources for the National Nutrition Monitoring System

o Provide adequate resources for the National Nutrition Monitoring System to implement these recommendations and for the committee, which is charged with interpreting the data collected by this system and also with assessing the need for improvements in the system.

o Identify more completely potential sources of complementary data for the committee to review and consider as part of the National Nutrition Monitoring System.

FIGURE 5. Progress Reported on Nutrition Monitoring Activities, 1987

Examples of USDA and DHHS Efforts to Update
and Better Coordinate Their Nutrition Monitoring Activities

o The Departments of Agriculture (USDA) and Health and Human Services (DHHS) recognize the need for up-to-date data on the nutritional and dietary status of the American population, and special subgroups. Accordingly, one or both Departments will be in the field collecting data every year through 1996.

USDA conducted the Continuing Survey of Food Intakes by Individuals (CSFII) in 1985 and 1986 to address this concern for timely data. The survey was designed specifically to supplement data from the larger Nationwide Food Consumption Survey (NFCS) being conducted this year. The Department plans to continue the CSFII after the 1987 NFCS is completed. Both the CSFII and NFCS include low-income samples in addition to a nationally representative sample of the population.

DHHS plans to conduct the third National Health and Nutrition Examination Survey (NHANES III) over a six-year period beginning in 1988. NHANES III is the latest of a series of studies involving interview and physical examination, as well as diagnostic and biochemical testing, of a representative sample of Americans. NHANES III will provide national estimates of diseases and health characteristics of the American population ages two months and above. Special sampling of infants, children, the elderly, and minority groups such as Blacks and Hispanics will also permit reliable estimates of the health and nutritional status of these groups.

o USDA and DHHS are striving to increase the coverage of the National Nutrition Monitoring System, and thereby make more effective use of Federal expenditures for nutrition monitoring and enhance the productivity of the system. The Joint Implementation Plan for a National Nutrition Monitoring System, which was delivered to Congress in 1981, is being expanded into an Operational Plan.

Areas of focus for the expanded plan include emphasizing components of the system in addition to the NFCS and NHANES, improving the system's information dissemination and exchange, and improving the research base for nutrition monitoring. The new Operational Plan covering the 1987 through 1996 time period is expected to be completed within the next month.

A task group has been formed within the Interagency Committee on Human Nutrition Research, co-chaired by USDA and DHHS, to identify research needs in the area of nutrition monitoring and to work to see these needs are met. As part of this process, the task group will examine surveys conducted at the Federal level that now provide or could potentially provide nutrition monitoring data.

o Coordination has been a major area of activity between the NFCS and NHANES staffs over the past two years. Both surveys will use the same food coding system and National Nutrient DataBank to obtain food composition values. The staffs have reviewed population descriptors and nutrition-related questions and recommended a set of common questions to improve

FIGURE 5. (continued)

comparability. These are being adopted by the agencies to the extent possible. To help data users understand the remaining differences in content and sampling design between these two surveys, data tape documentation will be improved.

- These data are used for a wide variety of purposes. Jointly, USDA and DHHS are giving increasing attention to the needs of health policy planners at the State and local levels. In addition to the annual Nutrient Data Bank Conferences, which focus on better understanding and proper use of nutrient data for dietary assessment, during 1986 USDA and DHHS participated in two workshops designed to help States use the CSFII, NFCS, and NHANES data. These workshops also allowed the Federal staff to gain a better understanding of the States' data needs.

  NCHS conducted four workshops in 1986 and two will be held in 1987 to acquaint researchers with techniques for analyzing the Hispanic Health and Nutrition Examination Survey. A group of users of NHANES data from government, academia, and industry also meet quarterly with NCHS staff to discuss how to best utilize NHANES resources and share analytical results.

- The workshops described in the preceding bullet illustrate one way that States can get assistance to help them use these nationally representative data in predictive models for their own populations. The Federal staffs are also willing to make available their knowledge about conducting surveys, so that interested State and local groups can conduct their own, an increasingly attractive option to the prohibitive cost of conducting nationwide surveys that are specifically valid at geopolitical levels such as a State or county. Another workshop is planned for June 1987 for this purpose.

- USDA and DHHS have recognized the need for interpretation of data from the Nutrition Monitoring system and proposed a reporting system in the 1981 Implementation Plan. The first report of the Joint Nutrition Monitoring Evaluation Committee (JNMEC) was delivered to Congress in July 1986. It is a first step toward providing integrated interpretation of data from the system. The Departments are currently developing plans for preparation of the second report to Congress, which is due in 1989.

  The CSFII data will be available for the second report on nutrition monitoring as will the results of eight cooperative agreements funded by USDA to examine the 1985 CSFII data in greater depth. Data from the DHHS Hispanic Health and Nutrition Examination Survey (HHANES) will also be available and will permit estimates of nutritional status and of other health characteristics to be made for Mexican-Americans, Puerto Ricans, and Cuban Americans.

- Timeliness of data and analysis has been an ongoing concern of the Departments, Congress, and the nutrition community. USDA's CSFII was designed so as to avoid this pitfall. The first wave of data was released as hard copy and on data tapes within six months of data collection. To further improve the timeliness of data release, data collection during NHANES III will be automated in mobile examination centers. Collection of information about dietary intake will also be automated in NHANES III.

TABLE 2. Calendar of Events

This calendar highlights major activities during this operational phase. Updating is anticipated as plans for the second half of the phase are finalized.

1987	Nutrition monitoring coordination meetings: Quarterly meetings of the Assistant Secretary for Health (DHHS) and Assistant Secretary for Food and Consumer Services (USDA); NCHS/HNIS Coordinating Group; ICHNR (and Subcommittee on Nutrition Monitoring Research)[1]
1987	ICHNR Conference of Federally-Supported Human Nutrition Research Units and Centers.[2] Topics were dietary methodology and human nutrient requirements - February 24 and 25, ICHNR, NIH and ARS
1987	Completion of CSFII-86, HNIS
1987	Start of NFCS-87, HNIS
1987	Start of NHANES III Pilot Tests, NCHS
1987	Health and Diet Study, Cycle 4, FDA[3]
1987	Nutrient Data Bank Conference[4]
1987	Information released on U.S. Food Supply in terms of food and nutrients, ERS and HNIS[4]
1987	NHANES Users Group, May and October, FDA Coordinates[5]
1987	ASTPHND Data Lab, HNIS, NCHS, FDA, and NIH
1987	HHANES Data Users Workshops in New York and Puerto Rico, NCHS
1987	Total Diet Study, FDA[4]
1987 or 1988	National Health Interview Survey Supplement on Dietary and Other Cancer Risk Factors, NCI and NCHS
1987 or 1988	National Telephone Survey of Weight-loss Practices, FDA and NHLBI
1988 or 1989	National Survey of Infant Feeding Practices, FDA
1988	Completion of NFCS-87, HNIS
1988	Release of Nutrient Data Base for Household Food Use, Release No. 2., and Nutrient Data Base for Individual Intake Surveys, Release No. 4 (to be used in calculating nutrients in NFCS-87), HNIS.
1988	Workshops for users of NFCS data, HNIS
1988	Start of NHANES III, NCHS
1988	Food Label and Package Survey (FLAPS), FDA[2]

TABLE 2. (continued)

1989	CSFII of general and low-income populations, each year 1989 through 1996, HNIS. Follow-up Consumer Perceptions Survey, HNIS, FSIS, and FDA
1989	Completion and forwarding to Congress of second NNMS report, DHHS/USDA
1990	Special survey of elderly persons with CSFII, HNIS
1990	National Health Interview Survey Supplement on Health Promotion and Disease Prevention Practices, NCHS
1991	Pilot test of new dietary survey procedures based on CSFII and NFCS-87 experience and methodology research
1991	Completion of NHANES III-Cycle 1 (first of two cycles), NCHS
1992	Completion and forwarding to Congress of third NNMS report, DHHS/USDA
1994	Completion of NHANES III-Cycle 2, NCHS
1995	Completion and forwarding to Congress of fourth NNMS report, DHHS/USDA
1995	National Health Interview Survey Supplement on Health Promotion and Disease Prevention Practices, NCHS

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[1] Quarterly meetings anticipated throughout this phase.
[2] Biennial conferences anticipated throughout this phase.
[3] Conducted every 18-22 months throughout this phase.
[4] Annually throughout this phase.
[5] Semiannual meetings anticipated throughout this phase.

Source: 1987 Operational Plan for the National Nutrition Monitoring System.

LEGISLATIVE ACTIVITIES

On January 30, 1984, a bill (H.R. 4684) to create a coordinated national nutrition monitoring and related research program was introduced in the House, following six years of joint oversight hearings on nutrition research and monitoring. Joint hearings by the House Committee on Science and Technology's Subcommittee on Science, Research and Technology, and Agriculture's Subcommittee on Department Operations, Research and Foreign Agriculture had concluded that current Federal efforts to collect, analyze, interpret and disseminate dietary and nutritional status data were untimely and gave inadequate attention to assessing high-risk groups and geographic areas. Following a hearing[30] and report[31] by the committees, the bill reached the House floor on September 25, 1984, but was defeated on a vote of 265 to 159 under suspension of the rules.[32] A similar bill, S. 3022, was introduced and referred to the Senate Committee on Agriculture, Nutrition and Forestry, but no action was taken.

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[30] U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research and Technology. H.R. 4684, National Nutrition Monitoring and Related Research Act of 1984. Joint hearing with Committee on Agriculture, Subcommittee on Department Operations, Research and Foreign Agriculture. 98th Cong., 2nd Sess., June 20, 1984. 287 p.

[31] U.S. Congress. House. Committee on Science and Technology. National Nutrition Monitoring and Related Research Act of 1984. Rept. 98-1076, Part 1. Sept. 25, 1984.

[32] Under suspension of the rules, a bill needs a two-thirds majority to pass.

On May 8, 1985, H.R. 2436 was introduced which was designed to make more effective use of Federal and State expenditures for nutrition monitoring and to improve the performance and benefits of current Federal nutrition monitoring and related research activities. H.R. 2436 was to establish a framework for achieving these objectives through the creation of an Interagency Board for Nutrition Monitoring and Related Research and an Advisory Council to serve as a communication link between the appointed members, the scientific and user communities, and the Federal Government. The Council was to provide scientific and technical advice on the development and implementation of the National Nutrition Monitoring and Related Research Program and evaluate the effectiveness of the implementation of that program.

The bill called for a 10-year comprehensive plan to be developed which included provision for continuous collection, processing and accelerated analysis of nutritional and dietary data through a sampling of the U.S. population designed to provide reliable data on high-risk groups and geographic areas. Interpretation of data analysis was to be contracted to a scientific body which was to publish biannual reports of the dietary, nutritional and health-related status of the U.S. population and nutritional quality of the food supply. The bill also set up a competitive grants program to stimulate nutrition monitoring methods research and a grants program for State and local governments to develop the capacity to conduct nutrition monitoring activities. Following a hearing June 25, 1985,[33] H.R. 2436 was marked up and voted out of the House Committee on Science and Technology on February 19, 1986.[34]

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[33] U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research and Technology. H.R. 2436, National Nutrition Monitoring and Related Research Act of 1985. Joint Hearing with Committee on Agriculture, Subcommittee on Department Operations, Research and Foreign Agriculture. 99th Cong., 1st Sess., June 25, 1985. 426 p.

[34] U.S. Congress. House. Committee on Science and Technology. National Nutrition Monitoring and Related Research Act of 1986. Rept. 99-481, Part 1. Mar. 4, 1986.

The House Committee on Agriculture marked up the bill and voted it out of Committee June 19, 1986.[35] The House passed the bill by a vote of 305 to 85 on June 26, 1986.[36]

On August 1, 1985, S. 1569, the Improved Public Health through Nutrition Monitoring Act of 1985 was introduced. The bill was referred to the Senate Committee on Governmental Affairs, but no action was taken by the committee. S. 1569 amended Title XVII of the Public Health Service Act to encourage health promotion and disease prevention through the implementation of a coordinated national nutrition monitoring system. While the bill emphasized the importance of nutrition to health promotion and disease prevention, the basic objectives and provisions of the bill were similar to H.R. 2436.

The House-passed version of H.R. 2436 was sent to the Senate July 14, 1986, and was referred to the Senate Committee on Governmental Affairs. The Committee voted on H.R. 2436 as amended (without further amendments) on August 12, 1986, and sent it to the Senate floor.[37] The Senate did not complete action on the bill by October 18, 1986 when the 99th Congress recessed, so the bill died.

On April 23, 1987, the National Nutrition Monitoring and Related Research Act of 1987 was introduced (H.R. 2151 and S. 1081). The bill was referred to the House Committees on Agriculture and Science, Space and Technology; in the

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[35] U.S. Congress. House. Committee on Agriculture. National Nutrition Monitoring and Related Research Act of 1986. Rept. 99-481, Part 2. June 19, 1986.

[36] National Nutrition Monitoring and Related Research Act of 1986. Floor Debate and Amendments. Congressional Record, Daily Ed., v. 132, no. 89, June 26, 1986. p. H4337-4340 and H4349-4378.

[37] U.S. Congress. Senate. Committee on Governmental Affairs. National Nutrition Monitoring and Related Research Act of 1986. Rept. 99-251, Oct. 3, 1986.

Senate it was referred to the Committee on Governmental Affairs. At the present time, the identical bills have 43 cosponsors in the House and 22 cosponsors in the Senate. Like the bills introduced in the 99th Congress, the purpose of the bills is to establish a coordinated National Nutrition Monitoring and Related Research Program, and a comprehensive plan for the assessment of the nutritional and dietary status of the U.S. population and the nutritional quality of the U.S. food supply, with provision for the conduct of scientific research and development in support of such a program and plan.

PROVISIONS OF THE PROPOSED NATIONAL NUTRITION MONITORING AND RELATED RESEARCH ACT OF 1987

Provisions of S. 1081 and H.R. 2151

-- Establishes a 10-year coordinated program;

-- Interagency Board for development and implementation of program to be cochaired by the Assistant Secretary of Agriculture and Assistant Secretary for Health;

-- An Administrator of Nutrition Monitoring and Related Research may be appointed by the Secretaries;

-- Assess the health and nutrition status of the U.S. population including low income and other high-risk groups;

-- Conduct methodological research and establish baseline data from which to better evaluate nutrition monitoring data;

-- Maintain existing surveys and coordinate other related food and nutrition data collections performed by the Federal Government;

-- Develop and maintain nutrient and related data banks;

-- Develop a mechanism to identify users of the data collected in nutrition monitoring;

-- Assist States and local governments in the development of procedures and networks for nutrition monitoring, as well as provide related scientific, and technical assistance, training and consultative services for this task;

- -- Create a competitive grants program for methodological research;
- -- Create a grants program to assist State and local governments with nutrition monitoring;
- -- Update and integrate the 1981 Joint Implementation Plan for Nutrition Monitoring;
- -- Coordinate related research in other agencies;
- -- Contract with an independent scientific agency/organization to interpret data;
- -- Require annual draft report be sent to Congress and put on public review before a final report is submitted;
- -- Create an 11 member Advisory Council to provide scientific and technical advice on the development and implementation of the program and plan to evaluate its effectiveness and submit an annual report;
- -- Require that all budget requests for funds to be used in implementing activities under this program be listed as line-items in the budgets of the respective agencies;
- -- Require the Secretaries to publish a report entitled "Dietary Guidelines for Americans" every five years; and
- -- Require any dietary guidelines to be published by the Federal Government be submitted to the Secretaries of Agriculture, and Health and Human/Services for review.

Over the several years of hearings on the nutrition monitoring legislation, the Administration, and various agencies, particularly USDA, have consistently opposed the bills. Their position has been and continues to be that the previous problems preventing the implementation of a comprehensive, coordinated system are being resolved, i.e., coordination has been achieved to the extent possible, up-to-date information is now available, timeliness of data release and analysis has been achieved, improved working relationships with States and other users has occurred, identification and pursuit of related research needs is moving forward. Their concerns about the nutrition monitoring legislation centers on money and management: that appropriation of large sums of new money will be required to meet the requirements of the bill; and the creation of new levels of management will be expensive in terms of time and money, delaying progress toward the comprehensive system.[38]

Proponents of the bills believe that despite the pronouncements of the Administration to the contrary, the Federal agencies have not succeeded in developing a coordinated surveillance program that provides necessary information on the nutritional status of the U.S. population. Proponents criticize current efforts to collect, analyze, interpret and disseminate dietary and nutritional status data as being uncoordinated, lacking adequate accountability, being untimely, using imprecise and nonstandardized assessment methodologies, giving inadequate attention to assessing high-risk groups and geographic areas, and failing to effectively use available resources.[39] They believe the arguments of opponents are unsubstantiated and only demonstrate a lack of willingness to establish a comprehensive national nutrition system and related research program, whether it is mandated or not. As of January 1988, the proponents included 36 scientific, professional and public health organizations as well as commodity, consumer, antihunger, senior citizen and religious groups (figure 6).

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[38] Harris, S. S. Nutrition Monitoring: A USDA Perspective. Journal of Nutrition Education, v. 19, no. 3, 1987. p. 128-130.

[39] Shipley-Moses, E. and J. M. Dodds. Nutrition Surveillance and Monitoring, Journal of Nutrition Education, v. 19, no. 3, 1987, p. 125-127.

FIGURE 6.

ORGANIZATIONS IN SUPPORT OF NATIONAL NUTRITION MONITORING

The American Academy of Pediatrics
The American Association of Retired Persons
The American Baptist Churches USA
The American College of Preventive Medicine
The American Dietetic Association
The American Heart Association
The American Home Economics Association
The American Institute of Nutrition
The American Medical Students Association
The American Nurses Association
The American Public Health Association
The American School Food Service Association
The American Society for Clinical Nutrition
The Association of State and Territorial Health Officers
The Association of Schools of Public Health
The Association of Teachers of Preventive Medicine
Bread for the World
Center on Budget and Policy Priorities
Coalition on Block Grants and Human Needs
Food Research and Action Center
Lutheran Office for Government Affairs
Mennonite Central Committee
National Association for WIC Directors
National Consumers League
National Council of La Raza
National Farmers Union
National Osteoporosis Foundation
National PTA
National Perinatal Association
National Student Campaign Against Hunger
Public Voice for Food and Health Policy
Service Employees International Union
Society for Nutrition Education
United States Conference of Local Health Officers
United Fresh Fruit and Vegetable Association
World Hunger Education Service
World Hunger Year

1/21/88

EXPENDITURES BY FEDERAL AGENCIES ON NUTRITION MONITORING ACTIVITIES

The bills on nutrition monitoring introduced in the 100th Congress would not authorize any new funds to be spent on nutrition monitoring activities. However, the Federal Government currently spends monies within the various Departments performing nutrition monitoring functions. The bills would require an interagency budget to be prepared that would reflect funds currently being spent within the various agencies on their respective nutrition monitoring activities. The bills also require that each agency include in its own budget a line item for the coordinated budget.

At the request of the Congressional Research Service the following data on Federal expenditures for nutrition monitoring activities and related research were provided by the Department of Agriculture (USDA)[40] and the Department of Health and Human Services (DHHS).[41] The data and accompanying notes are presented essentially as they were received from the agencies.

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[40] Harris, S. S. Deputy Assistant Secretary for Food and Consumer Services. U.S. Dept. of Agriculture. Letter to Donna Porter. June 25, 1986.

[41] McGinnis, J. M. Deputy Assistant Secretary for Health. Dept. of Health and Human Services. Letter to Donna Porter. July 18, 1986.

Department of Health and Human Services

National Center for Health Statistics (NCHS)[42]

-- National Health and Nutrition Examination Survey (NHANES); and

-- Hispanic Health and Nutrition Examination Survey (HHANES)

TABLE 3. HANES History Table
Expenditures⁺

Fiscal Year	NHANES I & II*	H HANES**	NHANES III	TOTAL
1980	Clean-up/Analysis $ 3,272,800	$ 0	$ 0	$3,272,800
1981	416,600	Planning 4,502,900	0	4,919,500
1982	448,150	Data Collection 7,764,900	0	8,213,050
1983	448,700	6,686,600	0	7,135,300
1984	515,600	7,366,600	0	7,882,200
1985	489,300	Data Collection 1,124,600 Cleanup/Analysis 2,572,400	Planning 1,968,000	6,154,300
1986	5,400	2,288,900	4,545,000	6,839,300
1987	0	1,786,000	7,918,000	9,704,000
TOTAL	$ 5,596,550	$34,092,900	$14,431,000	$54,120,450

⁺ Expenditures are for total survey, including nutrition component.

*NHANES is the National Health and Nutrition Examination Survey.
**HHANES is the Hispanic Health and Nutrition Examination Survey.

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[42] The total expenditures include staff, contractual arrangement and NCHS overhead. DHHS estimates that expenditures related to nutrition monitoring are about 40 percent of total expenditures.

Centers for Disease Control (CDC)

- -- Nutrition Surveillance Program
- -- CDC estimates expenditures for nutrition surveillance activities for FY 1980-1987 are $1.44 million per year. This figure includes 20 percent for overhead.

National Institutes of Health (NIH)

- -- NIH Program in Biomedical and Behavioral Nutrition Research and Training
- -- Data include expenditures for those projects that involve total nutrition research, nutrition status research and expenditures for nutrition status research as a percentage of total expenditures for nutrition status research were not available for FY 1986 and 1987. However, assuming the proportion of funds allocated to nutrition status remained constant for FY 1985, 1986 and 1987, then a figure of 14 percent might be used.

TABLE 4
Expenditures by the National Institutes of Health for Nutrition Research and for Projects in Nutritional Status Research*, FY 1980-1985
(dollars in thousands)

Year	Nutrition Research	Nutritional Status Research	Percent of Nutrition Research
1980	139,121	31,055	22
1981	148,501	34,520	23
1982	144,323	21,607	15
1983	164,306	30,871	19
1984	192,918	35,116	18
1985	207,349	29,769	14
1986	208,593**	N/A	
1987	202,700**	N/A	

* Includes research on methods for the determination of nutritional status and surveillance: dietary history and food consumption, biochemical determinants, anthropometry, and clinical examination.

** Estimates provided by NIH Division of Financial Management

Food and Drug Administration (FDA)

-- Nutrition Monitoring Components: Total Diet Study and Various Consumer Surveys

TABLE 5. FDA Nutrition Monitoring Components

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
Total Diet Study (Nutrition Part Only)				
FY80	84,885	42,880	-	127,765
FY81	75,705	52,930	-	128,635
FY82	92,100[a]	104,300	-	196,400[a]
FY83	92,000[a]	40,296[b]	-	132,296[a,b]
FY84	207,650	88,312	-	295,962
FY85	169,150	47,810	-	216,960
FY86	80,000[c]	44,000[c]	-	124,000[c]
FY87	180,000[c]	d	-	d
Key Human/Pediatric Nutrition Problem Areas				
FY80	-	0	271,276	271,276
FY81	-	670	0	670
FY82	-	0	105,861	105,861
FY83	-	8,760[b]	360,537	369,297[b]
FY84	-	57,380	495,174	552,554
FY85	-	56,840	588,635	645,475
FY86	-	36,000[c]	307,934[c]	343,934[c]
FY87	-	d	308,000[e]	d
Food Consumption, Diet and Health				
FY80	-	96,640	1,625,895	1,722,535
FY81	-	145,390	0	145,390
FY82	-	242,900	73,197	316,097
FY83	-	440,628[b]	0	440,628[b]
FY84	-	491,188	70,000	561,188
FY85	-	653,530	134,400	787,930
FY86	-	536,000[c]	80,000[c]	616,000[c]
FY87	-	d	110,000[e]	d
Food Labeling and Package Survey (FLAPS)				
FY80	-	256,000	89,788	345,788
FY81	-	62,980	0	62,980
FY82	-	280,000	115,508	395,508
FY83	-	162,936[b]	0	162,936[b]
FY84	-	258,300	55,765	314,065
FY85	-	274,240	94,921	369,161
FY86	-	504,000[c]	103,000[c]	607,000[c]
FY87	-	d	65,000[e]	d

TABLE 5 (continued)

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
FDA/NHLBI Diet - Heart Survey				
(Survey initiated FY84)				
FY84	-	0	75,000	75,000
FY85	-	26,820	91,402	118,222
FY86	-	0[c]	-	0[c]
FY87	-	d	-	d
Multipurpose Survey and Quick Turnaround Research Service				
FY80	-	73,600	92,416	166,016
FY81	-	19,430	0	19,430
FY82	-	0	108,086	108,086
FY83	-	28,908[b]	0	28,908[b]
FY84	-	0	0	0
FY85	-	0	175,402	175,402
FY86	-	40,000[c]	95,000[c]	135,000[c]
FY87	-	d	95,000[e]	d
Infant Feeding Practices				
(Survey initiated FY85)				
FY85	-	20,120	133,479	153,595
FY86	-	120,000[c]	95,000[c]	215,000[c]
FY87	-	d	90,511[e]	d
Dietary Supplement Survey				
FY80	-	7,680	-	7,680
FY81	-	6,700	-	6,700
FY82	-	2,800	-	2,800
FY83	-	2,628[b]	-	2,628[b]
(After FY83, work performed as part of Multipurpose Survey; contract funds specific for this project expended prior to FY80)				
Consumer Package Information Research				
FY80	-	9,600	87,950	97,550
FY81	-	4,020	87,338	91,358
FY82	-	172,200	-	172,200
FY83	-	26,280[b]	-	26,280[b]
FY84	-	1,833	-	1,833
(Project discontinued as such after FY84)				
Consumer Needs Research				
FY80	-	2,560	-	2,560
FY81	-	32,830	-	32,830
FY82	-	68,600	-	68,600
FY83	-	99,864[b]	-	99,864[b]
(Project discontinued as such after FY83)				

TABLE 5 (continued)

Project	Field, $	Headquarters, $	Contracts, $	Annual Total, $
Study of Weightloss Dieting (Project initiated in FY85)				
FY85	-	8,660	90,119	98,779
FY86	-	48,000[c]	115,000[c]	163,000[c]
FY87	-	d	0	d
Miscellaneous other Consumer Surveys Work and Projects				
FY80	-	0	174,567	174,567
FY81	-	0	30,000	30,000
FY82	-	0	50,000	50,000
FY83	-	19,272[b]	9,495	28,767[b]
FY84	-	22,660	31,434	54,094
FY85	-	0	84,000	84,000
FY86	-	0[c]	0[c]	0[c]
FY87	-	d	0[e]	d
Nutrient Analysis Methods - Lipids, Vitamins and Minerals				
FY80	-	287,360	-	287,360
FY81	-	417,410	-	417,410
FY82	-	273,000	-	273,000
FY83	-	409,968[b]	-	409,968[b]
FY84	-	464,360	-	464,360
FY85	-	435,280	-	435,280
FY86	-	544,000[c]	-	544,000[c]
FY87	-	d	-	d
Compliance Nutrient Analysis				
FY80	584,100	720,000	32,380	1,337,380
FY81	407,000	570,170	25,200	1,002,370
FY82	221,600	651,000	-	872,600
FY83	269,450	698,172[b]	-	967,622[b]
FY84	290,300	356,592	-	646,892
FY85	328,000	295,670	-	623,670
FY86	320,000[c]	180,000[c]	-	500,000[c]
FY87	315,000[c]	d	-	d
Nutrient Surveillance				
FY80	0	16,640	-	16,640
FY81	132,050	57,620	-	189,670
FY82	358,350	41,300	-	399,650
FY83	240,150	29,784[b]	-	269,934[b]
FY84	200,500	93,404	-	293,904
FY85	511,700	37,620	-	549,320
FY86	280,000[c]	144,000[c]	-	424,000[c]
FY87	280,000[c]	d	-	d

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[a] Estimates based on the Technical Plan; the Nutrition part was not separable from the data for the rest of the study for these years.

[b] Data for last two months of the year not retrievable; figures projected from ten months of data.

[c] Planned expenditures.

[d] Planning process in progress; to be completed by Aug. 1986.

[e] Contract support requested for consideration by the Center for Food Safety and Applied Nutrition, FDA for FY87.

NOTE: Assumptions underlying the estimates are the same for each study/survey.

Department of Agriculture

-- Human Nutrition Information Services (HNIS); and

-- Agricultural Research Service (ARS)

TABLE 6. USDA Monies Spent for Monitoring Activities
(millions of dollars)[a]

	Surveys and Methods Research		Food Composition	
Fiscal Year	HNIS[b]	ARS	HNIS	ARS[c]
1982	5.0	0.4	1.4	4.0
1983	3.5	0.7	1.5	4.7
1984	4.6[a]	0.6	1.6	6.5
1985	3.2	2.3	1.7	8.3
1986 (estimated)[d]	9.9	3.1	1.8	7.2
1987 (proposed)	3.3	3.3	1.8	7.5

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[a] Includes $2 million transferred to HNIS for special surveys: CSFII-II-Low-Income 1985 and PR-85.

[b] Includes data collection for Nationwide Food Consumption Surveys, Continuing Survey of Food Intakes by Individuals (CSFII), Survey of Household Food Consumption in Puerto Rico (PR-84), methodology studies, and special analyses of results.

[c] Includes research on food composition and bioavailability.

[d] Reflects estimates as reduced pursuant to Gramm, Rudman, and Hollings Bill.

FIFTH PROGRESS REPORT

THE HUMAN NUTRITION RESEARCH AND INFORMATION MANAGEMENT SYSTEM

NOVEMBER 15, 1987

Introduction

On July 23, 1982, the Secretaries of Agriculture and of Health and Human Services transmitted to Congress the "Plan for a Human Nutrition Research and Information Management (HNRIM) System." This plan was prepared pursuant to Section 1427 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3177), as amended by Section 1425 of the National Agricultural Research, Extension, and Teaching Policy Act Amendments of 1981 (Title XIV of P.L. 97-98). That Section provides as follows:

> HUMAN NUTRITION RESEARCH AND INFORMATION MANAGEMENT SYSTEM
>
> Section 1427. The Secretary [of Agriculture] and the Secretary of Health and Human Services shall formulate and submit to Congress, within one hundred and eighty days after the date of enactment of this section, a plan for a human nutrition research management system. This system shall be based on on-line data support capability allowing for fiscal accounting, management, and control of cross-agency human nutrition research activities. The plan shall provide for management activities of all agencies managing funds for human nutrition research activities under existing authorities and contain recommendations for any additional authorities necessary to achieve a human nutrition research management system.

The first report on HNRIM activities, covering the period from July 1982 to July 1983, was transmitted to the Congress on August 3, 1984; the second report, covering HNRIM activities from August 1983 to August 1984, was transmitted to the Congress on December 4, 1984. The third report, covering HNRIM activities from September 1984 to June 1985, was transmitted to the Congress on August 23, 1985; and the fourth report, covering activities of the HNRIM system from July 1985 through June 1986, was transmitted to the Congress on September 12, 1986. This report describes HNRIM system activities from July 1986 through June 1987, and constitutes the fifth annual report.

Current Status of the HNRIM System

The HNRIM system has now been fully operational for more than 2 years. It includes data on nutrition research and training expenditures from six Cabinet level agencies [Health and Human Services (HHS), U.S. Department of Agriculture (USDA), Veterans Administration (VA), Agency for International Development (AID), Department of Defense (DOD), and Department of Commerce (DOC)]; it also includes data from the National Aeronautics and Space Administration (NASA) and National Science Foundation (NSF), when they sponsor nutrition research. There are 25 data items associated with each project, e.g., name, institution, and address of the principal investigator, title of the research project, sponsoring Federal agency, project number assigned by the agency, total expenditures of the project, percentage of the project that comprises nutrition research, actual nutrition obligations, and nutrition classification code(s). In addition, abstracts are included for each project, where made available by the sponsoring agency.* A complete list of nutrition classification codes is given in Appendix A.

The most recent submissions by each agency comprise the on-line HNRIM data base, with submissions from prior years preserved on computer tape for easy accessibility. The data base resides on the National Institutes of Health (NIH) mainframe computer, and is updated yearly by the HNRIM System Coordinator, currently a staff member at the Nutrition Coordinating Committee, Office of Disease Prevention, Office of the Director, NIH.

Entry of FY 1986 data into the HNRIM system was completed as of September 20, 1987, for all participating agencies. NASA had no nutrition research projects during FY 1986, while data for NSF were unavailable. Since FY 1985 data were incomplete at the time the fourth report on HNRIM was submitted to the Congress, this fifth report includes data for both years, where appropriate. Total nutrition research and training expenditures for FY 1986 and FY 1985, summarized by Federal agency, are shown in Tables I and II, respectively.

Appendix B includes numbers of FY 1986 projects in the on-line HNRIM data base in each nutrition research classification category, by agency. Appendix C contains comparable data for FY 1985. With respect to number of projects, the five leading categories for all participating agencies in FY 1986 were (in descending order): "Cancer and Nutrition," "Vitamins," "Lipids (Fats and Oils)," "Nutrient Interactions," and "Other Diseases and Nutrition." In FY 1985, the five leading categories were: "Vitamins," "Cancer and Nutrition," "Lipids (Fats and Oils)," "Cardiovascular Diseases and Nutrition," and "Minerals and Trace Elements." The category "Trauma and Nutrition" showed the smallest number of projects for both Fiscal Years.

The HNRIM data base was queried 137 times between July 1, 1986, and June 30, 1987. The most frequently queried research categories were: "Essential Minerals and Trace Elements"; "Maternal Nutrition"; and "Vitamins." A complete analysis of the categories queried is presented in Appendix D. All queries were performed by the System Coordinator, either as part of the process of updating the data base, or in support of reports and publications within HHS. A significant number of the searches were performed at the request of various NIH or HHS offices. HNRIM system data were utilized in such publications as the Annual Report of the NIH Program in Biomedical and Behavioral Nutrition Research and Training; Nutrition Research at the NIH; Assessment of the Existing Scientific Literature and Research on Dietary Calcium and Its Importance in Human Health and Nutrition: Report to the Congress; The Relationship Between Dietary Cholesterol and Blood Cholesterol and Human Health and Nutrition: Report to the Congress; the HHS-USDA "Operational Plan for the National Nutrition Monitoring System: Report to the Congress"; and the NIH Data Book.

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*Abstracts are available for 96 percent of FY 1986 projects.

Availability of the HNRIM Database

In accordance with the recommendation of the Joint USDA/HHS Task Force on HNRIM, and with the approval of the Interagency Committee on Human Nutrition Research (ICHNR), computer-readable copies of the HNRIM data base were offered for sale to the general public through the National Technical Information Service (NTIS) of the Department of Commerce as of September 1986. In keeping with Federal policy established for the Federal Research in Progress (FRIP) System and for the USDA Current Research Information System (CRIS), expenditure figures on individual projects were not made publicly available. Currently, fiscal years 1982-85 are available through NTIS; FY 1986 data are undergoing final processing and should be available through NTIS by the end of the 1987 calendar year.

In the year since HNRIM was offered for sale through NTIS, only a single purchase of the data base has been made, despite its reasonable price (under $500 for most purposes). Approximately a dozen inquiries were received in response to advertisement in the NIH Guide for Grants and Contracts in October 1986; however, in nearly all of these cases, purchase of the data base was not feasible for one of two reasons: 1) the individual needed only a single or occasional search capability; and/or 2) the individual did not have the access to a mainframe computer and to programming support requisite to purchase and use of the data base.

Perceiving a need for greater public accessibility of the HNRIM data base, the ICHNR, on July 17, 1987, approved a joint proposal by USDA staff and the HNRIM System Coordinator that the HNRIM data base be made available to the public through Dialog Information Retrieval Service. While the ICHNR had previously decided against carrying HNRIM as a separate file on Dialog on the basis of cost, it was ascertained that HNRIM could be included in USDA's CRIS data base, already on Dialog, at virtually no additional cost to the government. Negotiations are currently under way between Dialog Information Retrieval Service and USDA officials, and it is anticipated that FY 1986 HNRIM system data (excluding expenditure figures) will be available to the general public through Dialog by January 1988. It is felt that this measure, together with appropriate publicizing of the data base, will allow for much greater accessibility by the public. The data base will continue to reside on-line in the NIH mainframe computer (from which fiscal data will be available), and to be available for purchase through NTIS.

Federal Expenditures for Nutrition Research and Training, Fiscal Years 1985 and 1986

Tables I and II present, respectively, the FY 1986 and 1985 Federal nutrition research and training expenditures by agency. In FY 1986 a total of $305 million provided support for 3,870 projects. The HHS expended $231 million, or 76 percent of total funds, and funded 67 percent of all projects. Within HHS, NIH accounted for expenditures of $213 million, or 70 percent of Federal expenditures and 92 percent of HHS expenditures in nutrition research and training; the Food and

Drug Administration (FDA) and the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA) expended 3 percent and 2 percent, respectively, of all Federal nutrition research and training funds. The USDA expended $61 million, representing 20 percent of total funds and 26 percent of total projects. The VA expended an estimated $5.5 million, or 2 percent of the funds, and supported 6 percent of the number of projects, while AID expended $5 million, or 2 percent of all funds, in support of fewer than 1 percent of all projects. The remaining agencies each had smaller, more specialized programs that contributed less than 1 percent of total Federal nutrition research and training dollars.

In comparison, FY 1985 nutrition research and training expenditures totaled $292 million for all Federal agencies and supported 3,905 projects. Of this amount, HHS agencies contributed $221 million, or 76 percent of the funds, and 68 percent of the number of projects. Within HHS, NIH provided the largest component, amounting to 72 percent of all Federal expenditures and 94 percent of all HHS expenditures in nutrition research and training; FDA and ADAMHA each accounted for 2 percent of all Federal nutrition research and training funds. The USDA expended $60 million, or 21 percent of all funds, in support of 25 percent of all projects. The VA provided an estimated $5.3 million in support of 239 projects, accounting for 2 percent of all Federal nutrition research and training funds and 6 percent of all projects; and AID expended $3.5 million, or 1 percent of all Federal nutrition research and training dollars, in support of fewer than 1 percent of all projects. The remaining agencies each contributed less than 1 percent of total Federal nutrition research and training dollars.

Analysis of Table I and II data for HHS, USDA, and VA, the three largest contributors of Federal dollars for nutrition research and training, shows increases of 5, 2, and 4 percent, respectively, for FY 1986 over FY 1985. This represents essentially level funding when inflation is taken into account. The trend toward level funding is also reflected in total Federal nutrition research and training expenditures, which increased 4 percent during the same time period. In contrast, total nutrition research and training expenditures increased 8 percent over the previous year in FY 1985 and 17 percent over the previous year in FY 1984. Data for fiscal years 1984, 1983, and 1982 have been included for purposes of comparison, and are shown in Tables III, IV, and V, respectively.

Tables VI and VII present, respectively, FY 1986 and 1985 nutrition expenditures in five categories of activities: extramural research, research manpower development, extramural training, intramural research and training, and research on public information and education. Funding for extramural research--i.e., research in undergraduate and graduate schools of nutrition, in basic science departments of universities, in schools of medicine, dentistry and public health, in other schools for health professionals, and in research facilities throughout the United States and in foreign countries--represented by far the largest category, and grew 12 percent between FY 1985 and FY 1986, from $217 million to $242 million. In sharp contrast, funding for intramural research and training in government laboratories dropped 17 percent, from $69 million in FY 1985 to $57 million in FY 1986; most of the reduction in this category was felt by USDA, with a drop of 31 percent. Research manpower development funds, extramural training funds, and funds for research on public information and education also showed significant reductions (10, 14, and 12 percent, respectively) during the same time period.

Tables VIII and IX indicate the distribution of Federal human nutrition research and training expenditures by support mechanism for FY 1986 and FY 1985, respectively. Between FY 1985 and FY 1986, grants (investigator-initiated research) grew 4.6 percent, from $182 million to $191 million; intramural research and training, as noted above, dropped 17 percent, from $69 million to $57 million; research contracts rose 47 percent, from $20 million to $30 million; and cooperative agreements virtually doubled, from $8.5 million to $16.5 million. Interagency agreements showed a substantial drop (from $4 million to $3 million), while formula grants dropped slightly.

Table I

FY 1986 EXPENDITURES AND NUMBER OF PROJECTS IN HUMAN NUTRITION RESEARCH, MANPOWER DEVELOPMENT, TRAINING, AND EDUCATION BY FEDERAL AGENCIES

(dollars in thousands)

	Expenditures		Projects	
	$	%	Number	%
Department of Health and Human Services:				
National Institutes of Health	212,978[+]	70	2,435	63
Food and Drug Administration	8,143	3	47	1
Alcohol, Drug Abuse and Mental Health Administration	7,548	2	99	3
Health Resources and Services Administration	1,151	<1	8	<1
National Center for Health Statistics	804	<1	4	<1
Centers for Disease Control	569	<1	1	<1
Total HHS	231,193	76	2,594	67
U.S. Department of Agriculture	61,265	20	1,003	26
Veterans Administration	5,500*	2	248	6
Agency for International Development	4,998	2	16	<1
Department of Defense	782	<1	7	<1
Department of Commerce	1,000	<1	2	<1
Total Federal Expenditures	304,738	100**	3,870	100**

[+] Final figure; previously reported figures may differ
* Estimate
**Total imprecise due to rounding

Table II

FY 1985 EXPENDITURES AND NUMBER OF PROJECTS IN HUMAN NUTRITION RESEARCH, MANPOWER DEVELOPMENT, TRAINING, AND EDUCATION BY FEDERAL AGENCIES

(dollars in thousands)

	Expenditures		Projects	
	$	%	Number	%
Department of Health and Human Services:				
National Institutes of Health	207,315+	72	2,525	65
Alcohol, Drug Abuse and Mental Health Administration	6,479	2	88	2
Food and Drug Administration	6,159	2	39	1
Health Resources and Services Administration	1,129	<1	12	<1
Centers for Disease Control	395	<1	1	<1
Total HHS	221,477	76	2,665	68
U.S. Department of Agriculture	60,122	21	976	25
Veterans Administration	5,277*	2	239	6
Agency for International Development	3,522	1	15	<1
Department of Defense	1,150	<1	6	<1
Department of Commerce	397	<1	4	<1
Total Federal Expenditures	291,945	100**	3,905	100**

+ Final figure; previously reported figures may differ
* Estimate
**Total imprecise due to rounding

Table III

FY 1984 EXPENDITURES AND NUMBER OF PROJECTS IN HUMAN NUTRITION RESEARCH, MANPOWER DEVELOPMENT, TRAINING, AND EDUCATION BY FEDERAL AGENCIES

(dollars in thousands)

	Expenditures		Projects	
	$	%	Number	%
Department of Health and Human Services:				
National Institutes of Health	$192,918⁺	71	2,367	61
Food and Drug Administration	4,504	2	35	1
Alcohol, Drug Abuse and Mental Health Administration	3,928	1	67	2
Health Resources and Services Administration	298	<1	5	<1
Centers for Disease Control	259	<1	1	<1
Total HHS	201,907	75	2,475	64
Department of Agriculture	57,064	21	1,043	27
Agency for International Development	5,521	2	18	<1
Veterans Administration	4,631	2	282	7
National Science Foundation	850*	<1	75*	2
Department of Commerce	342	<1	5	<1
Total Federal Expenditures	$270,315	100**	3,898*	100**

⁺ Final figure; previously reported figures may differ
* Estimate
**Total imprecise due to rounding

Table IV

FY 1983 EXPENDITURES AND NUMBER OF PROJECTS IN HUMAN NUTRITION RESEARCH, MANPOWER DEVELOPMENT, TRAINING, AND EDUCATION, BY FEDERAL AGENCIES

(dollars in thousands)

	Expenditures		Projects	
	$	%	Number	%
Department of Health and Human Services:				
National Institutes of Health	164,306	71	2,232	61
Food and Drug Administration	4,210	2	24	<1
Alcohol, Drug Abuse and Mental Health Administration	3,419	1	52	1
Centers for Disease Control	321	<1	4	<1
Health Resources and Services Administration	298	<1	5	<1
Total HHS	172,554	75	2,317	63
U.S. Department of Agriculture (86% on HNRIM)	48,631	21	973	27
Veterans Administration	4,239*	2	283	8
Agency for International Development	4,072	2	11	<1
National Science Foundation	900*	<1	80*	2
Department of Commerce	164	<1	3	<1
Total Federal Expenditures	230,560	100**	3,667	100**

* Estimate
**Total imprecise due to rounding

Table V

FY 1982 EXPENDITURES AND NUMBER OF PROJECTS IN HUMAN NUTRITION RESEARCH, MANPOWER DEVELOPMENT, TRAINING, AND EDUCATION, BY FEDERAL AGENCIES

(dollars in thousands)

	Expenditures		Projects	
	$	%	Number	%
Department of Health and Human Services:				
National Institutes of Health	144,324	70	2,199	62
Food and Drug Administration	5,392	3	31	<1
Alcohol, Drug Abuse and Mental Health Administration	2,591	1	50	1
Health Resources and Services Administration	120	<1	5	<1
Total HHS	152,427	74	2,285	65
U.S. Department of Agriculture	46,358	22	911	26
Veterans Administration	3,108*	2	318	9
Agency for International Development	2,602	1	12	<1
National Science Foundation	1,000*	<1	#	
Department of Defense	1,368	<1	5	<1
Department of Commerce	304	<1	3	<1
Total Federal Expenditures	207,167	100**	3,534	100**

* Estimate
# Not available
**Total imprecise due to rounding

Table VI

FY 1986 EXPENDITURES BY FEDERAL AGENCIES IN HUMAN NUTRITION RESEARCH, MANPOWER DEVELOPMENT, TRAINING, AND EDUCATION, BY AREA OF SUPPORT

(dollars in thousands)

Agency	Extramural Research	Extramural Res. Man-power Dev.	Extramural Training	Intramural Research	Intramural Training	Rsch. on Public Info. and Education#	Total
AID	4,998						4,998
DOC				1,000			1,000
DOD	405			377			782
HHS:							
ADAMHA	5,911	448	92	1,097			7,548
CDC				569			569
FDA	1,754			6,389		(153)	8,143
HRSA	1,151						1,151
NCHS				804			804
NIH	198,404	1,909	3,261	8,992	413	(11,634)	212,978
Total	207,220	2,357	3,353	17,851	413	(11,787)	231,194
USDA	29,561			31,704		(770)	61,265
VA				5,500*			5,500*
TOTAL	242,184	2,357	3,353	56,432	413	(12,557)	304,738

# The dollar amounts in this category are included within the funding mechanisms and the total amount

* Estimate

Table VII

FY 1985 EXPENDITURES BY FEDERAL AGENCIES IN HUMAN NUTRITION RESEARCH, MANPOWER DEVELOPMENT, TRAINING, AND EDUCATION, BY AREA OF SUPPORT

(dollars in thousands)

	Extramural			Intramural			
Agency	Research	Res. Man-power Dev.	Training	Research	Training	Rsch. on Public Info.and Education#	Total
AID	3,522						3,522
DOC	397						397
DOD	381			769			1,150
HHS:							
ADAMHA	4,953	606	105	815			6,479
CDC				395			395
FDA	1,148			5,011		(114)	6,159
HRSA	1,109			20			1,129
NIH	191,022	2,018	3,772	9,284	1,219	(13,590)	207,315
Total	198,232	2,624	3,877	15,525	1,219	(13,704)	221,477
USDA	14,132			45,990		(509)	60,122
VA				5,277*			5,277*
TOTAL	216,664	2,624	3,877	67,561	1,219	(14,213)	291,945

# The dollar amounts in this category are included within the funding mechanisms and the total amount

* Estimate

Table VIII

FY 1986 HUMAN NUTRITION RESEARCH AND TRAINING EXPENDITURES OF FEDERAL AGENCIES BY SUPPORT MECHANISM

(dollars in thousands)

	Extramural						
Agency	Grants	Contracts	Interagency Agreements	Formula Grants	Cooperative Agreements	Intramural	Total
AID	4,096	376			526		4,998
DOC						1,000	1,000
DOD	173		232			377	782
HHS:							
ADAMHA	6,451					1,097	7,548
CDC						569	569
FDA		1,657	97			6,389	8,143
HRSA	1,151						1,151
NCHS						804	804
NIH	176,545	13,212	2,549		11,267	9,405	212,978
Total	184,147	14,869	2,646		11,267	18,264	231,193
USDA	2,554	14,661		7,618	4,728	31,704	61,265
VA						5,500*	5,500*
TOTAL	190,970	29,906	2,878	7,618	16,521	56,845	304,738

* Estimate

Table IX

FY 1985 HUMAN NUTRITION RESEARCH AND TRAINING EXPENDITURES OF FEDERAL AGENCIES BY SUPPORT MECHANISM

(dollars in thousands)

	Extramural						
Agency	Grants	Contracts	Interagency Agreements	Formula Grants	Cooperative Agreements	Intramural	Total
AID	3,170	200			152		3,522
DOC					397		397
DOD	184		197			769	1,150
HHS:							
ADAMHA	5,664					815	6,479
CDC						395	395
FDA		995	153			5,011	6,159
HRSA	1,084	25				20	1,129
NIH	170,204	15,257	3,694		7,657	10,503	207,315
Total	176,952	16,277	3,847		7,657	16,744	221,477
USDA	2,174	3,890		7,728	340	45,990	60,122
VA						5,277*	5,277*
TOTAL	182,480	20,367	4,044	7,728	8,546	68,780	291,945

* Estimate

Appendix A

HNRIM CLASSIFICATION SYSTEM

1. Maternal Nutrition
2. Infant and Child Nutrition (0-12 years)
3. Adolescent Nutrition (13-18 years)
4. Adult Nutrition (19-65 years)
5. Nutrition of the Elderly (65+ years)
6. Cardiovascular Disease and Nutrition
7. Cancer and Nutrition
8. Other Diseases and Nutrition
9. Trauma (including burns) and Nutrition
10. Immunology and Nutrition -- Infection
11. Obesity, Anorexia, and Appetite Control
12. Genetics and Nutrition
13. Nutrition and Function (behavior, performance, and stress)
14. Nutrient-Nutrient/Drug/Toxicant Interactions and Nutrient Toxicity
15. Other Conditions and Nutrition
16. Research on Nutritional Status (includes methods development)
17. Carbohydrates
18. Lipids (fats and oils)
19. Alcohols
20. Proteins and Amino Acids
21. Vitamins
22. Essential Minerals and Trace Elements
23. Water and Electrolytes
24. Fiber
25. Other Nutrients in Food (e.g., nonessential amino acids & trace metals)
26. Food Composition, Nutrient Content, Research on Analytic Methods
27. Bioavailability and Absorption of Nutrients
28. Effects of Technology on Nutritional Characteristics of Foods and Diets
29. Other Research in Food Sciences
30. Studies on Methods for Food Consumption Surveys and of Survey Data
31. Research on Dietary Practices, Food Consumption, and Determinants
32. Studies of Methods for Informing and Educating the Public
33. Other Research in Nutrition Education
34. Studies of the Effects of Government Policy and Socioeconomic Factors
35. Parenteral, Enteral, and Elemental Nutrition

Appendix B

Table B-1. NUMBER* OF PROJECTS FOR NIH INSTITUTES, DIVISIONS, AND CENTERS SUPPORTING HUMAN NUTRITION RESEARCH AND TRAINING IN FY 1986, BY HNRIM CLASSIFICATION CODES

		AGENCIES (NO. PROJECTS)														
HNRIM CLASSIFICATION CODE	TOTAL	DRR	FIC	NCI	NCNR	NEI	NHLBI	NIA	NIAID	NIAMS	NICHD	NIDDK	NIDR	NIEHS	NIGMS	NINCDS
01-Maternal Nutr.	129	18					1				94	12	4			
02-Infant & Child Nutr.	253	25		5	2		34		7		144	27	5		2	2
03-Adolescent Nutr.	54	2		1			24				25	2				
04-Adult Nutrition	44	2		10	1		2			1	16	12				
05-Nutr. of the Elderly	100	7		8		2	13	61		1	2	5			1	
06-Cardiovasc. Dis. & Nutr.	408	58		4			331	1			3	9				2
07-Cancer & Nutrition	645	41		596			1					7				
08-Other Diseases & Nutr.	408	61		7	1	7	1	3	1	19	43	250	6		2	7
09-Trauma and Nutrition	22	3										1			18	
10-Infection-Immun. & Nutr.	117	30		36				6	20	1	11	13				
11-Obes. Anorex. & Appetite	257	82		22			26	4			19	90	1	1	1	11
12-Genetics and Nutrition	249	12		91		3	49	3		5	33	49		2		2
13-Nutrition and Function	188	13		10	2	2	1	3		8	41	87	1	1		19
14-Nutrient Interactions	401	56		137			3			8	18	142		26	2	9
15-Other Conditions & Nutr.	420	59		12	1	3	8	1		22	38	270	4	1		1
16-Nutritional Status	245	15		61		1	22		1	3	99	38	1		4	
17-Carbohydrates	126	5		13		5	3	1			23	71	1		1	3
18-Lipids (Fats & Oils)	406	37		101		7	155	1	1	7	29	62		1	5	
19-Alcohols	39	6		22			1				4	3	1		2	

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*A grant or contract may be assigned to more than one of these classification codes.
DRR = Division of Research Resources; FIC = Fogarty International Center; NCI = National Cancer Institute; NCNR = National Center for Nursing Research; NEI = National Eye Institute; NHLBI = National Heart, Lung and Blood Institute; NIA = National Institute on Aging; NIAID = National Institute of Allergy and Infectious Diseases; NIAMS = National Institute of Arthritis and Musculoskeletal and Skin Diseases; NICHD = National Institute of Child Health and Human Development; NIDDK = National Institute of Diabetes and Digestive and Kidney Diseases; NIDR = National Institute of Dental Research; NIEHS = National Institute of Environmental Health Sciences; NIGMS = National Institute of General Medical Sciences; NINCDS = National Institute of Neurological and Communicative Disorders and Stroke.

Appendix B

Table B-1. NUMBER* OF PROJECTS FOR NIH INSTITUTES, DIVISIONS, AND CENTERS SUPPORTING HUMAN NUTRITION RESEARCH AND TRAINING IN FY 1986, BY HNRIM CLASSIFICATION CODES (cont'd)

		AGENCIES (NO. PROJECTS)														
HNRIM CLASSIFICATION CODE	TOTAL	DRR	FIC	NCI	NCNR	NEI	NHLBI	NIA	NIAID	NIAMS	NICHD	NIDDK	NIDR	NIEHS	NIGMS	NINCDS
20-Proteins & Amino Acids	290	18		111		12	8	3			49	73	1		7	8
21-Vitamins	469	22	1	159		52	14	3	1	32	46	129	4		2	4
22-Minerals & Tr. Elements	271	10	1	58		20	13	5	2	15	41	87	9	4		6
23-Water & Electrolytes	120	4		4		4	77	1		1	7	20	1			1
24-Fiber	31	4		22			1	1				3				
25-Other Nutrients in Food	46	6		12			4				4	18		1		1
26-Food Composition	55	19		17			2				14	3				
27-Bioavail. of Nutrients	53	7		16	1		2				3	22			1	1
28-Effects of Technology	15	8		7												
29-Other Res. in Food Sci.	23	14		5			1				1	2				
30-Food Consump. Surveys	23	4		12		1	1				3	2				
31-Diet. Prac. & Determin.	186	8		34	1		78	4		2	14	42	1			2
32-Res. on Public Ed.	64			34			24	1			4	1				
33-Other Res. in Nutr. Ed.	13	1		6			2				3	1				
34-Govt. Policy & Socioec.	2			1							1					
35-Parent. Ent. Elem. Nutr.	99	24		14	2	1	1		2		13	26			15	1

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*A grant or contract may be assigned to more than one of these classification codes.
DRR = Division of Research Resources; FIC = Fogarty International Center; NCI = National Cancer Institute; NCNR = National Center for Nursing Research; NEI = National Eye Institute; NHLBI = National Heart, Lung and Blood Institute; NIA = National Institute on Aging; NIAID = National Institute of Allergy and Infectious Diseases; NIAMS = National Institute of Arthritis and Musculoskeletal and Skin Diseases; NICHD = National Institute of Child Health and Human Development; NIDDK = National Institute of Diabetes and Digestive and Kidney Diseases; NIDR = National Institute of Dental Research; NIEHS = National Institute of Environmental Health Sciences; NIGMS = National Institute of General Medical Sciences; NINCDS = National Institute of Neurological and Communicative Disorders and Stroke.

Appendix B

Table B-2. NUMBER* OF PROJECTS FOR HHS AGENCIES SUPPORTING HUMAN NUTRITION RESEARCH AND TRAINING IN FY 1986, BY HNRIM CLASSIFICATION CODES

		AGENCIES (NO. PROJ.)					
HNRIM CLASSIFICATION CODE	TOTAL	ADAMHA	CDC	FDA	HRSA	NCHS	NIH
01-Maternal Nutrition	135	2	1	1	2		129
02-Infant & Child Nutr.	272	4	1	6	6	2	253
03-Adolescent Nutrition	59			2	1	2	54
04-Adult Nutrition	50	2		2		2	44
05-Nutrition of the Elderly	105	2		1		2	100
06-Cardiovascular Dis. & Nutr.	419	4		3		4	408
07-Cancer & Nutrition	654			7		2	645
08-Other Diseases & Nutr.	419	3		5		3	408
09-Trauma and Nutrition	24			2			22
10-Infection--Immunol. & Nutr.	124			6	1		117
11-Obesity, Anorexia & Appetite	297	33		6	1		257
12-Genetics and Nutrition	259	4		3	3		249
13-Nutrition and Function	237	40		8	1		188
14-Nutrient Interactions	412	3		8			401
15-Other Conditions & Nutr.	430	1		9			420
16-Nutritional Status	257	1	1	9	1		245
17-Carbohydrates	130	1		3			126
18-Lipids (Fats & Oils)	409	1		2			406
19-Alcohols	61	22					39
20-Proteins & Amino Acids	304	7		6	1		290
21-Vitamins	478	5		4			469
22-Minerals & Trace Elements	278	3		4			271
23-Water & Electrolytes	121			1			120
24-Fiber	32			1			31
25-Other Nutrients in Food	58	6		6			46
26-Food Composition	65			10			55
27-Bioavailability of Nutrients	57			4			53
28-Effects of Technology	20			5			15
29-Other Res. in Food Sciences	24			1			23
30-Food Consumption Surveys	30			7			23
31-Dietary Practices & Determin.	200			13	1		186
32-Res. on Public Education	67			3			64
33-Other Res. in Nutr. Ed.	17			4			13
34-Govt. Policy & Socioeconomics	6			4			2
35-Parent., Enteral, Elem. Nutr.	103	4					99

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*A grant or contract may be assigned to more than one of these classification codes.

Appendix B

Table B-3. NUMBER* OF PROJECTS FOR FEDERAL AGENCIES SUPPORTING HUMAN NUTRITION RESEARCH AND TRAINING IN FY 1986, BY HNRIM CLASSIFICATION CODES

		AGENCIES (NO. PROJ.)					
HNRIM CLASSIFICATION CODE	TOTAL	AID	HHS	DOC	DOD	USDA	VA
01-Maternal Nutrition	184	2	135			47	
02-Infant & Child Nutr.	330	4	272			53	1
03-Adolescent Nutrition	79		59			19	1
04-Adult Nutrition	118		50		6	62	
05-Nutrition of the Elderly	151		105			28	18
06-Cardiovascular Dis. & Nutr.	491		419	2		54	16
07-Cancer & Nutrition	705		654	1		27	23
08-Other Diseases & Nutr.	521	1	419	2		36	63
09-Trauma and Nutrition	28		24			1	3
10-Infection--Immunology& Nutr.	144		124			11	9
11-Obesity, Anorexia & Appetite	332		297			28	7
12-Genetics and Nutrition	263		259			4	
13-Nutrition and Function	335	1	237		7	80	10
14-Nutrient Interactions	548		412			133	3
15-Other Conditions & Nutr.	474		430			30	14
16-Nutritional Status	410	2	257			130	21
17-Carbohydrates	216		130		2	64	20
18-Lipids (Fats & Oils)	564		409	2	1	131	21
19-Alcohols	81		61			1	19
20-Proteins & Amino Acids	450		304			125	21
21-Vitamins	620	3	478			92	47
22-Minerals & Trace Elements	500	2	278			184	36
23-Water & Electrolytes	140		121			9	10
24-Fiber	81		32			44	5
25-Other Nutrients in Food	79		58			14	7
26-Food Composition	307		65	2		240	
27-Bioavailability of Nutrients	181	1	57			113	10
28-Effects of Technology	338	1	20			317	
29-Other Res. in Food Sciences	179	1	24			153	1
30-Food Consumption Surveys	73		30		1	42	
31-Dietary Practices & Determin.	303	3	200		2	92	6
32-Res. on Public Education	85		67			18	
33-Other Res. in Nutr. Ed.	39		17			14	8
34-Govt. Policy & Socioeconomics	46	5	6			35	
35-Parent., Enteral, Elem. Nutr.	148		103				45

*A grant or contract may be assigned to more than one of these classification codes.

Appendix C

Table C-1. NUMBER* OF PROJECTS FOR NIH INSTITUTES, DIVISIONS, AND CENTERS SUPPORTING HUMAN NUTRITION RESEARCH AND TRAINING IN FY 1985, BY HNRIM CLASSIFICATION CODES

HNRIM CLASSIFICATION CODE	NO. PROJ.	AGENCIES
01-Maternal Nutrition	152	DRR, NHLBI, NIADDK, NICHD, NIDR
02-Infant & Child Nutr.	367	DRR, FIC, NCI, NHLBI, NIADDK, NIAID, NICHD, NIDR, NIGMS, NINCDS
03-Adolescent Nutrition	60	DRR, NCI, NHLBI, NIADDK, NICHD
04-Adult Nutrition	48	DRR, NCI, NHLBI, NIADDK, NICHD
05-Nutrition of the Elderly	113	DRR, NCI, NEI, NHLBI, NIA, NIADDK, NICHD, NINCDS
06-Cardiovasc. Dis. & Nutr.	474	DRR, NCI, NHLBI, NIA, NIADDK, NICHD, NINCDS
07-Cancer & Nutrition	591	DRR, NCI, NIADDK
08-Other Diseases & Nutr.	364	DRR, FIC, NCI, NEI, NHLBI, NIA, NIADDK, NIAID, NICHD, NIDR, NINCDS
09-Trauma and Nutrition	29	DRR, NIADDK, NIGMS
10-Infection-Immunol. & Nutr.	118	DRR, NCI, NIA, NIADDK, NIAID, NICHD
11-Obesity, Anorexia, & Appetite	261	DRR, NCI, NHLBI, NIA, NIADDK, NICHD, NIDR, NIEHS, NIGMS, NINCDS
12-Genetics and Nutrition	266	DRR, NCI, NEI, NHLBI, NIA, NIADDK, NICHD, NIEHS, NINCDS
13-Nutrition and Function	229	DRR, NCI, NEI, NHLBI, NIA, NIADDK, NICHD, NIDR, NINCDS
14-Nutrient Interactions	316	DRR, NCI, NHLBI, NIADDK, NICHD, NIEHS, NIGMS, NINCDS
15-Other Conditions & Nutr.	372	DRR, NCI, NEI, NHLBI, NIA, NIADDK, NICHD, NIDR, NIGMS, NINCDS
16-Nutritional Status	317	DRR, NCI, NEI, NHLBI, NIADDK, NIAID, NICHD, NIDR, NIGMS, NINCDS
17-Carbohydrates	138	DRR, FIC, NCI, NEI, NHLBI, NIA, NIADDK, NICHD, NIDR, NIGMS, NINCDS
18-Lipids (Fats & Oils)	473	DRR, FIC, NCI, NEI, NHLBI, NIA, NIADDK, NICHD, NIEHS, NIGMS, NINCDS
19-Alcohols	39	DRR, NCI, NHLBI, NIADDK, NICHD, NIEHS
20-Proteins & Amino Acids	277	DRR, NCI, NEI, NHLBI, NIA, NIADDK, NICHD, NIDR, NIGMS, NINCDS
21-Vitamins	500	DRR, FIC, NCI, NEI, NHLBI, NIA, NIADDK, NIAID, NICHD, NIDR, NIGMS, NINCDS
22-Minerals & Trace Elements	280	DRR, FIC, NCI, NEI, NHLBI, NIA, NIADDK, NIAID, NICHD, NIDR, NIEHS, NINCDS
23-Water & Electrolytes	141	DRR, NCI, NEI, NHLBI, NIA, NIADDK, NICHD, NIDR
24-Fiber	33	DRR, NCI, NIADDK
25-Other Nutrients in Food	50	DRR, NCI, NHLBI, NIADDK, NICHD, NIEHS, NINCDS
26-Food Composition	44	DRR, NCI, NHLBI, NIADDK, NICHD
27-Bioavailabil. of Nutrients	75	DRR, NCI, NHLBI, NIADDK, NINCDS
28-Effects of Technology	10	DRR, NCI
29-Other Res. in Food Sciences	18	DRR, NCI, NIADDK, NICHD
30-Food Consumption Surveys	22	NCI, NEI, NHLBI, NIADDK, NICHD
31-Diet. Practices & Determ.	210	DRR, NCI, NHLBI, NIA, NIADDK, NICHD, NIDR, NINCDS
32-Res. on Public Education	80	NCI, NHLBI, NIADDK, NICHD
33-Other Res. in Nutr. Ed.	15	NCI, NHLBI, NIADDK, NICHD
34-Govt. Policy & Socioecon.	4	NCI, NIADDK, NICHD
35-Parenteral, Enteral & Elemental Nutr.	81	FIC, NCI, NEI, NHLBI, NIA, NIADDK, NIAID, NICHD, NIGMS, NINCDS

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*A grant or contract may be assigned to more than one of these classification codes.

Appendix C

Table C-2. NUMBER* OF PROJECTS FOR HHS AGENCIES SUPPORTING HUMAN NUTRITION RESEARCH AND TRAINING IN FY 1985, BY HNRIM CLASSIFICATION CODES

HNRIM CLASSIFICATION CODE	TOTAL NO. PROJ.	AGENCIES (NO. PROJ.) ADAMHA	CDC	FDA	HRSA	NIH
01-Maternal Nutrition	162	7	1	2		152
02-Infant & Child Nutr.	383	3	1	5	7	367
03-Adolescent Nutrition	62			1	1	60
04-Adult Nutrition	53	2		1	2	48
05-Nutrition of the Elderly	118	4		1		113
06-Cardiovascular Dis. & Nutr.	482	4		2	2	474
07-Cancer & Nutrition	597	1		5		591
08-Other Diseases & Nutr.	371	4		3		364
09-Trauma and Nutrition	31			2		29
10-Infection--Immunol. & Nutr.	125	1		6		118
11-Obesity, Anorexia & Appetite	295	29		4	1	261
12-Genetics and Nutrition	275	5		2	2	266
13-Nutrition and Function	278	38		5	6	229
14-Nutrient Interactions	328	4		6	2	316
15-Other Conditions & Nutr.	378			6		372
16-Nutritional Status	327	1	1	6	2	317
17-Carbohydrates	139			1		138
18-Lipids (Fats & Oils)	476	1		2		473
19-Alcohols	55	16				39
20-Proteins & Amino Acids	285	4		2	2	277
21-Vitamins	506	4		2		500
22-Minerals & Trace Elements	285	2		2	1	280
23-Water & Electrolytes	142			1		141
24-Fiber	34			1		33
25-Other Nutrients in Food	61	6		5		50
26-Food Composition	54			10		44
27-Bioavailability of Nutrients	79			4		75
28-Effects of Technology	17			7		10
29-Other Res. in Food Sciences	22			4		18
30-Food Consumption Surveys	26			4		22
31-Dietary Practices & Determin.	222	1		10	1	210
32-Res. on Public Education	81			1		80
33-Other Res. in Nutr. Ed.	15					15
34-Govt. Policy & Socioeconomics	4					4
35-Parenteral, Enteral & Elemental Nutrition	82				1	81

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* A grant or contract may be assigned to more than one of these classification codes.

Appendix C

Table C-3. NUMBER* OF PROJECTS FOR FEDERAL AGENCIES SUPPORTING HUMAN NUTRITION RESEARCH AND TRAINING IN FY 1985, BY HNRIM CLASSIFICATION CODES

HNRIM CLASSIFICATION CODE	TOTAL NO. PROJ.	AGENCIES (NO. PROJ.)					
		AID	HHS	DOC	DOD	USDA	VA
01-Maternal Nutrition	201	1	162			38	
02-Infant & Child Nutr.	419	1	383			34	1
03-Adolescent Nutrition	87		62			24	1
04-Adult Nutrition	113		53		5	55	
05-Nutrition of the Elderly	171		118			32	21
06-Cardiovascular Dis. & Nutr.	567		482	4		66	15
07-Cancer & Nutrition	647		597			34	16
08-Other Diseases & Nutr.	479		371	3		48	57
09-Trauma and Nutrition	37		31			2	4
10-Infection--Immunology& Nutr.	142		125			10	7
11-Obesity, Anorexia & Appetite	336		295			32	9
12-Genetics and Nutrition	280		275			4	1
13-Nutrition and Function	365	1	278		6	74	6
14-Nutrient Interactions	474		328	1		136	9
15-Other Conditions & Nutr.	432		378			34	20
16-Nutritional Status	482	2	327			126	27
17-Carbohydrates	229		139		2	63	25
18-Lipids (Fats & Oils)	642		476	4	1	135	26
19-Alcohols	80		55			2	23
20-Proteins & Amino Acids	451	1	285			134	31
21-Vitamins	653	1	506			100	46
22-Minerals & Trace Elements	490	2	285			161	42
23-Water & Electrolytes	162		142			10	10
24-Fiber	83		34			43	6
25-Other Nutrients in Food	83		61			12	10
26-Food Composition	332		54	4		274	
27-Bioavailability of Nutrients	203	2	79			109	13
28-Effects of Technology	349	2	17			330	
29-Other Res. in Food Sciences	212	1	22			188	1
30-Food Consumption Surveys	72		26		1	44	1
31-Dietary Practices & Determin.	327	2	222		2	91	10
32-Res. on Public Education	102		81			21	
33-Other Res. in Nutr. Ed.	39	1	15			12	11
34-Govt. Policy & Socioeconomics	55	6	4			45	
35-Parenteral, Enteral & Elemental Nutrition	129		82				47

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* A grant or contract may be assigned to more than one of these classification codes.

Appendix D

FREQUENCY OF USE OF HNRIM DATA ITEMS FOR INFORMATION RETRIEVAL

The 137 queries of the HNRIM system between July 1, 1986, and June 30, 1987, show the following frequency of use of the HNRIM data fields:

DATA FIELDS QUERIED

Data Field	Number of times used	
Sponsoring Agency		55
Fiscal Year		44
Group		35
Content of the Narrative		25
Nutrition Classification Code:		
01-Maternal Nutrition	3	
11-Obesity, Anorexia, and Appetite Control	2	
16-Research on Nutritional Status, Including Methods Development	2	
21-Vitamins	3	
22-Essential Minerals and Trace Elements	9	
30-Studies on Methods for Food Consumption Surveys and of Survey Data	2	
31-Research on Dietary Practices, Food Consumption, and Determinants	2	
TOTAL		23
Project ID number		22
Department		21
Project. Title		17
Funding Mechanism		8
All others		5

OPERATIONAL PLAN FOR THE
NATIONAL NUTRITION MONITORING SYSTEM

U.S. Department of Health and Human Services
Public Health Service

U.S. Department of Agriculture
Food and Consumer Services

August 1987

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ACRONYMS AND ABBREVIATIONS

The following list of acronyms and abbreviations is provided as a quick index of terms and Federal departments, agencies, and activities that are mentioned more than once in this report. Parenthetical acronyms and abbreviations identify the parent agency and department.

ASTPHND	Association of State and Territorial Public Health Nutrition Directors
BRFSS	Behavioral Risk Factor Surveillance System (CDC/DHHS)
CDC	Centers for Disease Control (DHHS)
CNRU	Clinical Nutrition Research Unit (NIH/DHHS)
CSFII	Continuing Survey of Food Intakes By Individuals (HNIS/USDA)
CSSS	Coordinated State Surveillance System (CDC/DHHS)
DHHS	Department of Health and Human Services
ERS	Economic Research Service (USDA)
ES	Extension Service (USDA)
FASEB	Federation of American Societies for Experimmental Biology
FDA	Food and Drug Administration (DHHS)
FLAPS	Food Labeling and Package Survey (FDA/DHHS)
FNS	Food and Nutrition Service (USDA)
FSIS	Food Safety and Inspection Service (USDA)
HHANES	Hispanic Health and Nutrition Examination Survey (NCHS/DHHS)
HNIS	Human Nutrition Information Service (USDA)
INFOODS	International Food Composition Data System
ICHNR	Interagency Committee on Human Nutrition Research
JNMEC	Joint Nutrition Monitoring Evaluation Committee (USDA/DHHS)
LSRO	Life Sciences Research Office (FASEB)
NCI	National Cancer Institute (NIH/DHHS)
NCL	Nutrient Composition Laboratory (ARS/USDA)
NDB	Nutrient Data Bank (HNIS/USDA)
NFCS	Nationwide Food Consumption Survey (HNIS/USDA)
NHLBI	National Heart, Lung, and Blood Institute (NIH/DHHS)
NIA	National Institute on Aging (NIH/DHHS)
NICHD	National Institute of Child Health and Human Development (NIH/DHHS)
NIH	National Institutes of Health (DHHS)
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases (NIH/DHHS)
NHANES	National Health and Nutrition Examination Survey (NCHS/DHHS)
NHIS	National Health Interview Survey (NCHS/DHHS)
NNMS	National Nutrition Monitoring System
OASFCS	Office of the Assistant Secretary for Food and Consumer Services (USDA)
OASH	Office of the Assistant Secretary for Health (DHHS)
PHS	Public Health Service (DHHS)
TDS	Total Diet Study (FDA/DHHS)
USDA	United States Department of Agriculture

PREFACE

The National Nutrition Monitoring System (NNMS) is a complex assortment of interconnected activities which provide regular information about the contribution that diet and nutritional status make to the health of the American people and about the factors affecting diet and nutritional status.[1] These activities fall into the five categories of health and nutritional status measurements, food consumption measurements, food composition measurements, dietary knowledge and attitude assessment, and food supply determinations.

The National Health and Nutrition Examination Survey (NHANES) and the Nationwide Food Consumption Survey (NFCS) form the core of the system. NHANES is conducted periodically by the National Center for Health Statistics (NCHS) of the Department of Health and Human Services (DHHS). It consists of a series of surveys of probability samples of the U.S. population. The surveys include health histories, medical examinations, laboratory measurements, and dietary interviews. Analyses of the resulting data provide assessments of the health and nutritional status of the U.S. population. Two national surveys have been completed--NHANES I (1971-1974) and NHANES II (1976-1980). A third, NHANES III (1988-1994), is scheduled to begin in September 1988. A survey of Hispanic Americans, the Hispanic Health and Nutrition Survey (HHANES), was completed in 1984.

NFCS, the responsibility of the Human Nutrition Information Service (HNIS) of the Department of Agriculture (USDA), has been conducted at roughly 10-year intervals since the mid-1930s. NFCS collects data on household food use and on food intake at home and away from home by individual household members. NFCS is based on a national probability sample of households. Data collected include the kinds, amounts, and costs of food used by households during a 7-day period and the food

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[1] Nutrition monitoring is defined as an on-going description of nutrition conditions in a population--with particular attention to subgroups defined in socioeconomic terms--for purposes of planning, analyzing effects of policies and programs, and predicting future trends (Mason _et al_., 1984). Nutrition monitoring is characterized by regular data collection, by a focus on populations, and by linkages with the decision-making process. It also provides information about factors that affect diet and nutritional status in a population. NNMS data are used primarily for national nutrition planning; its large monitoring surveys are not fully adequate for evaluation of food assistance programs, although the surveys do collect information about program participation for use as variables in studies of determinants of nutritional and dietary status (DHHS/USDA, 1986). Issues of definition and purposes, and of the specific use of monitoring data for program evaluation are discussed further in Mason _et al_. (1984) and in _Nutrition Monitoring in the United States: A Progress Report from the Joint Nutrition Monitoring Evaluation Committee_ (DHHS/USDA, 1986).

actually consumed by household members during a 3-day period. Analysis of survey data provide assessments of the adequacy of nutrient intakes of the U.S. population and population segments. The last in the series of national surveys was conducted in 1977-78 and the most recent began in April 1987. A smaller Continuing Survey of Food Intakes by Individuals (CSFII), initiated in 1985, provides information about dietary intakes between the larger decennial surveys.

USDA and DHHS, as well as other Federal agencies, carry out a variety of other monitoring activities that contribute to the understanding of the dietary and nutritional well-being of the population. For example, the USDA Human Nutrition Information Service and Economic Research Service (ERS) provide yearly estimates of the U.S. food supply and its nutrient content. HNIS also maintains the National Nutrient Data Bank. The DHHS Food and Drug Administration (FDA) determines levels of selected nutrients and contaminants in diets prepared from standard market baskets of foods in several regions of the country and supports quantitative assessments of vitamin and mineral supplement intake. Its Food Label and Package Survey (FLAPS) provides information on the nutritional quality of packaged foods through the examination of nutrition labels and through nutrient analysis of products bearing labels. FDA also conducts assessments of consumer knowledge, attitudes, and practices about diets. The Centers for Disease Control (CDC) of DHHS collects information on the health status of people in high-risk groups who use public health facilities in 34 states. These and related monitoring activities of the two Departments are described in appendix 1.

The NNMS maintains formal linkages with Federal nutrition policymakers through representation on the DHHS Nutrition Policy Board and the Subcommittee for Human Nutrition of USDA's Committee on Research and Education. It also maintains formal linkages with the Federal nutrition research community through the Interagency Committee on Human Nutrition Research.

The Agricultural Research Service (ARS) of USDA and the National Institutes of Health (NIH) of DHHS provide most of the research base underlying its efforts. ARS conducts basic research on human nutritional status assessment, requirements, and methods for determining the composition of foods. NIH supports the country's largest program in human nutrition research, including research on assessment of nutritional status, nutritional epidemiology, and clinical nutrition (DHHS/USDA, 1986). CDC, which conducts research on methods to assess nutritional status, and FDA, which conducts research on methods to measure nutrient and fiber content of foods, also support the monitoring activities' research base. Linkages with the nutrition policy arena and nutrition research community are illustrated in appendix 2.

Coordination among the major components of the monitoring system is the joint responsibility of the Office of the Assistant Secretary for Health (OASH), DHHS, and the Office of the Assistant Secretary for Food and Consumer Services (OASFCS), USDA. In the coordination of monitoring efforts, OASH-DHHS takes leadership responsibility for efforts to measure health and nutritional status, and OASFCS-USDA takes responsibility for food composition measurements and food supply determinations.

Responsibility for the other categories of activities--food consumption measurements and dietary knowledge and attitudes assessment--is shared by the two Departments. These assignments are based on primary data collection responsibilities as currently practiced.

This report is a revision of the Joint Implementation Plan for a Comprehensive National Nutrition Monitoring System that was submitted to Congress in 1981. Prepared by USDA and DHHS under the aegis of the Assistant Secretary for Food and Consumer Services, USDA, and the Assistant Secretary for Health, DHHS, the 1981 plan described national nutrition monitoring activities underway, and specified goals and implementation activities for a nutrition monitoring system. The goals were:

- Achievement of the best possible coordination of the two largest components of the system--the National Health and Nutrition Examination Survey and the Nationwide Food Consumption Survey, and
- Development of a reporting system to translate findings from the two surveys and other monitoring activities into periodic reports to Congress on the nutritional status of the American population.

This report, the Joint Operational Plan for the National Nutrition Monitoring System, extends the implementation plan into its next phase. It contains three chapters. Chapter I presents the goals for this operational phase: two expanded goals of the implementation plan and one new goal. Chapter II describes progress achieved during the system's implementation phase. Chapter III covers the activities that will be undertaken during the operational phase. A calendar of events is included at the end of Chapter III.

CHAPTER I

THE GOALS FOR THIS OPERATIONAL PHASE

The 1981 implementation plan set two goals--better coordination of the two core surveys and the development of a system for reporting on the dietary and nutritional status of the U.S. population. Substantial progress has been made in both areas, and these goals will continue to be emphasized as the system moves from an implementation phase into an operational phase.

The goals for this operational phase build on the goals of the 1981 plan and include a new goal to improve the research base for nutrition monitoring. The new elements of each goal respond to recommendations by Federal, State, and local policymakers and program managers, the Congress, and the scientific community to include a wider range of nutrition monitoring activities, improve the system's ability to measure the nutritional status of high-risk groups, improve the relevance of data for policy decisions, and improve information dissemination and exchange.

GOAL A: Achieve a Comprehensive System Through Coordination Among NNMS Components

This goal focuses on achieving the best possible coordination of the National Health and Nutrition Examination Survey (NHANES) and the Nationwide Food Consumption Survey (NFCS) and expanding coordination efforts to include other Federal surveys that contain nutrition monitoring components. Emphasis is given to the need for improved coverage of "at risk" populations (improved ability to identify and reach populations at high nutritional risk) and improved temporal coverage of the U.S. population (continuous monitoring).

A.1. Include All Appropriate Nutrition Monitoring Activities

The NFCS and NHANES will continue to comprise the foundation of the National Nutrition Monitoring System (NNMS). They will provide, on a regular basis, important data on the nutritional health of a national sample of the population and comprehensive information about U.S. food consumption patterns.

The long-term goal is to integrate existing Federal surveys and surveillance activities into a network of activities that provides a more complete picture of the nutritional health of the total population and special subgroups than could the component surveys alone. Surveys and other activities added to the existing system may target specific populations or types of data collection not now adequately covered, and thereby supplement the current NHANES-NFCS data base.

A.2. Improve Coverage of Major Population Groups at Risk

Monitoring the dietary and nutritional status of the U.S. population, especially of those groups likely to be at highest nutritional risk, is an important component of the Department of Agriculture's (USDA) and the Department of Health and Human Services' (DHHS) nutrition-related missions. USDA's Human Nutrition Information Service (HNIS), for example, recently completed a survey of low-income women and their children as part of its Continuing Survey of Food Intakes By Individuals (CSFII), and includes special samples of low-income populations in its decennial NFCS. DHHS's National Center for Health Statistics (NCHS) has oversampled low-income groups as well as physiologically high-risk groups in its national surveys and has recently completed a survey of the health and nutritional status of Hispanic Americans. The Coordinated State Surveillance System of the Centers for Disease Control continuously monitors key indicators of nutritional status in two vulnerable groups--pregnant women and young children.

Some groups considered to be at nutritional risk, e.g., the homeless and migrants, are not included in the existing surveys. Other groups, including some racial minority groups, are not sampled in large enough numbers to permit accurate estimates of their dietary and nutritional status. The elderly--a subpopulation that may have a higher proportion of individuals who are nutritionally at risk--requires special attention. While NFCS has covered those over the age of 75 years in special surveys and its basic surveys, NHANES has not done so until now.

In view of these considerations, assessing and improving, where necessary, the coverage of high-risk populations by the NNMS has been made an explicit focus of this plan. Attention will be directed to identifying high-risk groups and coverage gaps, implementing survey designs capable of making estimates for targeted groups, and, to the extent feasible within fiscal constraints, conducting special surveys of groups not covered in national surveys or existing surveillance systems.

A.3. Improve Temporal Coverage

This goal refers to the NNMS' ability to continuously monitor the diet and nutritional status of the U.S. population. During the 1970s, a national nutrition survey was in the field nearly every year--the first National Health and Nutrition Examination Survey (NHANES I) in 1971-1974, the second National Health and Nutrition Examination Survey (NHANES II) in 1976-1980, and the Nationwide Food Consumption Survey (NFCS) in 1977-1978. There was, therefore, nearly continuous temporal coverage of the dietary intake and nutritional status of the U.S. population.

This temporal coverage was lacking in the first half of the 1980s when no national surveys were conducted. Although the Hispanic Health and Nutrition Examination Survey was conducted in 1982-1984, it was a special survey of three ethnic groups and the samples were drawn from three areas of the country--Mexican Americans residing in five southwestern states, Cuban Americans residing in Miami, Florida, and Puerto Ricans residing in selected counties of New York, New Jersey, and Connecticut. In 1985 HNIS initiated its CSFII to provide dietary data prior to NFCS-87. The CSFII, conducted in 1985 and 1986, surveyed women 19-50 years of age and their children 1-5 years of age in the general population and in the low-income population. Men ages 19-50 years were also surveyed in 1985. Such continuous monitoring of food consumption is especially important because consumption responds to many short-term changes such as food prices and availability as well as changing consumer attitudes and preferences.

It is a goal of the NNMS to have at least one national survey in the field every year to improve the temporal coverage of the U.S. population.

A.4. Improve Comparability Among Surveys

Departmental efforts over the past five years have focused on improving the comparability of the health and nutrition surveys conducted by NCHS and the dietary surveys conducted by HNIS. Substantial progress has been made in identifying common descriptors for a number of sociodemographic and dietary intake variables, and the surveys now share a common nutrient data base. During the operational phase, the Departments will exert every effort to achieve and maintain comparability related to the designs of the surveys, will urge comparability among additional surveys, and will explore the development of core data sets as part of their long-term strategy.

GOAL B: Improve Information Dissemination and Exchange

This goal continues the Departments' commitment to preparation of comprehensive reports on the dietary and nutritional status of the U.S. population. New emphasis is given to continued timely reporting and interpretation of data, to development of comparable reports and tape documentation, to increasing the usefulness of the system for meeting the decision-making needs of policymakers and program managers, and to increasing information exchange between data users and generators.

B.1. Continue Reporting System to Congress

The 1981 implementation plan laid out a mechanism that would integrate into common reports the results of the monitoring system's component nutrition activities. Reports were to be issued every three years. The reporting function was implemented by an expert scientific panel--the DHHS-USDA Joint Nutrition Monitoring Evaluation Committee (JNMEC)--which drew primarily on data from NHANES and NFCS to develop a report on the dietary and nutritional status of the population. The first report, entitled Nutrition Monitoring in the United States: A Progress Report from the Joint Nutrition Monitoring Evaluation Committee, was issued in July 1986.

This reporting mechanism, implemented by an expert scientific group, will continue. The next report will be issued in 1989.

B.2. Continue Timely Reporting and Interpretation of Data

Concerted efforts over the past five years by both Departments have reduced the time required to process, analyze, and release reports and public use data tapes. The Departments will continue to give a high priority to timeliness of data analysis and reporting.

B.3. Develop Comparable Reports and Tape Documentation

The diversity of subject matter, the many possible uses of the data, and the range of expertise of the users are constraints to standardization of formats for data reports and tapes. The potential value of the data is so high, however, that each monitoring system organization should include information in its documents to help users see how the data may be complementary to other disseminated data. Thus, each agency of the NNMS that produces written and computer tape output will strive to ensure that its documentation is comprehensive and comparable with that of other releases.

B.4. Increase Policy Relevance

Data from surveys must not only be timely and usable (goals B.2. and B.3.), but must also be useful. Usefulness requires that the data be directly related to policy, program management, and research needs. NNMS activities provide information relevant to Federal agriculture and public health policies and programs. Toward this end, they describe, insofar as methodologies permit, the adequacy and safety of U.S. diets, the nutritional status of the population, and the factors that affect diet and nutritional status. Major population subgroups for which problems of undernutrition and overnutrition exist are identified. NNMS activities also monitor trends in dietary and nutritional status at the national level, which can be used to determine whether observed problems are being rectified. They do not, however, have the capacity to assess the effectiveness of individual programs.

Information from the NNMS may be used to make decisions about, for example, programs to provide food assistance, nutrition education, special health services, nutrition labeling, food fortification, and other regulatory issues. Information from monitoring system activities is also used by the nutrition research community, as it develops hypotheses to investigate the role of dietary and nutritional factors in disease causation and prevention.

The component agencies of the monitoring system will provide data and information outputs that are timely, usable, and useful. The NNMS during the implementation phase was directed toward uses at the Federal policy level and did not emphasize data needs at the State and local levels. In order for the monitoring system to be relevant beyond Federal policy and program issues, a continuous process must also exist that attempts to determine and meet the decision-making needs of persons in State and local government, academia, and the private sector. Thus, during this operational phase, increased efforts will be made to understand the data needs of States and localities and to help their policymakers to interpret data from national surveys to meet their particular decision-making needs.

B.5. Improve Information Exchange Between Data Users and Generators

Dynamic information exchange between data users and those who generate the data is an essential part of an effective monitoring system. Effective exchange requires mechanisms by which those responsible for policy and program planning can communicate their information requirements to those responsible for obtaining the data supporting the NNMS. The latter, the "data generators" should in turn give special attention to developing designs, collection methods, and processing procedures that are responsive to data users' needs. In addition, to foster full and appropriate use of NNMS data, the data generators should regularly inform data users about the survey designs and methodologies and their strengths and weaknesses.

Goals B.2 (timeliness), B.3. (data release), and especially B.4 (relevance to decision-maker needs) are closely interwoven with objectives and functions involved in accomplishing this goal. The focus here is on increased efforts specifically aimed at improving the exchange of information betweens persons and organizations that use the data from NNMS and those that generate it, as may be accomplished through education, communication, and technical services.

GOAL C: Improve the Research Base for Nutrition Monitoring

This goal highlights the widely-recognized need for strengthening the scientific base for nutrition monitoring. Research needed to support nutrition monitoring activities falls into two broad categories. The first is methodological research specific to the conduct of surveys and surveillance activities, for example, to develop the most appropriate dietary interview instrument to measure usual intake in large, cross-sectional surveys, or to determine the feasibility of a hospital-based surveillance system for severe pediatric malnutrition. A limited amount of research in this category is currently undertaken by the agencies responsible for NNMS activities.

The second category includes research conducted by the broader nutrition community for its own purposes which also has application to nutrition monitoring. This is exemplified in Human Nutrition Research: The Federal Five-Year Plan, prepared by the Interagency Committee on Human Nutrition Research (ICHNR, 1986), the coordinating body for Federal human nutrition research efforts. The research plan identifies five priority areas in addition to nutrition monitoring: nutrition requirements through the life cycle; nutrient content, bioavailability, and interactions; research on the role of nutrition in the etiology, prevention, and treatment of chronic diseases and conditions; energy regulation, obesity, and related eating disorders; and nutrition education. Each of these has components applicable to nutrition monitoring activities. For example, research on the nutrient content of foods (nutrient content, bioavailability, and interactions) can be applied to updating food composition data bases.

The USDA Comprehensive Plan for a National Food and Human Nutrition Research and Education Program (USDA, 1986) and the NIH Annual Report on Biomedical and Behavioral Research Programs, FY 1985 (NIH, 1986) illustrate that nutrition research applicable to the NNMS includes, but is not limited to, the formally designated category of nutrition monitoring research.

It is a goal and expectation of the NNMS to strengthen the research base for nutrition monitoring by identifying and elaborating the nutrition monitoring research needed to improve the conduct of its activities and interpretation of its data, and by urging (and initiating, to the extent feasible) research efforts that will improve the scientific basis for monitoring.

CHAPTER II

PROGRESS DURING THE IMPLEMENTATION PHASE--1981-1986

Progress has been made toward achieving the two goals laid out in the 1981 implementation plan: improve coordination of NHANES and NFCS, and develop and implement a reporting system. Since these are being retained as goals for the next phase (as Goals A.4 and B.1), and progress has already been made toward meeting the expanded goals, the specific accomplishments during the implementation phase are listed in reference to the new goals:

A. Achieve a comprehensive system through coordination among NNMS components
B. Improve information dissemination and exchange
C. Improve the research base for nutrition monitoring

GOAL A: Achieve a Comprehensive System Through Coordination Among NNMS Components

A.1. Include All Appropriate Nutrition Monitoring Activities

The 1981 implementation plan focused on coordination of the two surveys that contribute the central core of data, NHANES and NFCS. Accordingly, most attention during the implementation phase was directed toward these two surveys. Within the past year, increasing attention has been directed toward other Federal nutrition monitoring activities. Using the framework recommended by the Joint Nutrition Monitoring Evaluation Committee, DHHS and USDA undertook preparation of a directory of these activities.

A.2. Improve Coverage of Major Population Groups at Risk

- In response to expressed needs of researchers and others concerned with the health status and care of Hispanic people, NCHS designed and conducted a special survey, the Hispanic Health and Nutrition Examination Survey (HHANES or Hispanic HANES) from 1982 through 1984. Much of the data has been released (see Goal B.2., this chapter).

- In response to a Congressional mandate, HNIS assessed the nutritional content of diets of households in Puerto Rico.

- Measurement of the dietary intake of low-income populations in the U.S. has also received emphasis. For example, in the preparation for CSFII-85, HNIS conducted a pilot study to evaluate procedures for longitudinal surveys of low-income groups--Mexican-Americans, American Indians, blacks, whites, and elderly in urban and rural areas; CSFII-85 and

CSFII-86 included national samples of low-income households, and have reported results in reports and on public use data tapes.

- A mechanism to monitor the prevalence of common nutrition-related problems in high-risk populations of pregnant women, initiated by the Centers for Disease Control (CDC) in 1979, has been expanded. In 1986, 14 States, the District of Columbia, and Puerto Rico participated in the Pregnancy Nutrition Surveillance System, with records submitted on approximately 70,000 pregnancies.

- Thirty-four States, the District of Columbia, and Puerto Rico participated in the CDC-coordinated Pediatric Nutrition Surveillance System in 1986. The States submitted approximately 2 million records for analysis and achieved an average county/clinic coverage of approximately 78 percent. CDC also furnished data management expertise and/or software packages to assist 5 States in processing and analyzing their own data. Through presentations, seminars, and workshops on the nutrition surveillance system, over 1,800 health professionals were reached.

- In 1984 CDC initiated a State-based surveillance system using random digit dialing telephone survey methodology in 19 States and the District of Columbia. The system collects data from adult respondents to determine the prevalence of behavioral risk factors associated with premature death and disability. These include nutrition-related risk factors such as obesity, hypertension, excessive alcohol consumption, and lack of physical exercise. The Behavioral Risk Factor Surveillance System extended to more than 30 States in 1986, providing State-specific results that could be used for program planning and monitoring trends.

A.3. Improve Temporal Coverage

- Responding to the need for continuous monitoring of the population, both HNIS and NCHS redesigned the surveys planned to begin in the last half of the 1980s.

  * Temporal coverage was built into the design of NHANES III so that information on the nutritional status and health of the population will be provided for two time periods--1988-1991 and 1992-1994.

  * NFCS-87 provides information for each season on food consumption for households and individual household members.

  * The CSFII conducted in 1985 and 1986 is a means of continuously monitoring the dietary status of individuals in the general and low-income populations in the years between the decennial NFCS. CSFII's panel approach of 6 days data collected over a year was adopted after two large-scale methods studies were conducted to identify the most suitable data collection method and number of days to provide an estimate of "usual" intake. This approach has not been used before by HNIS.

- FDA recognizes the importance of continuous monitoring of the food supply. It's annual Total Diet Study (TDS) regularly monitors the levels of selected contaminants and nutritional elements in the U.S. food supply and estimates the intakes of these substances in representative diets of specific age-sex groups. The TDS was updated in 1982 to reflect the food consumption patterns indicated by NFCS-77 and NHANES II. FDA's Food Labeling and Package Survey (FLAPS) includes a biennial probability survey of retail packaged foods as well as an ongoing surveillance program for nutrition labeling.

- Annual estimates of the nutrient content of the U.S. food supply have been expanded to cover additional nutrients and other food components important to health.

A.4. Improve Comparability Among Surveys

- DHHS and USDA jointly sponsored a study by the National Research Council's Food and Nutrition Board of uses of data from national food consumption surveys. The study was intended to document the extent and diversity of priority data needs and to help the Departments plan future surveys that would be responsive to these needs. The report, National Survey Data on Food Consumption: Uses and Recommendations, was issued in 1984 (National Research Council, 1984). It recommended that the two core surveys, NFCS and NHANES, not be merged or replaced, and that a common methodologic core be developed to link them. Other short and longer-term actions were also recommended, for example, to redesign the surveys as continuous survey processes. The recommendations have been considered in the Departments' continuing efforts to improve the comparability of their surveys.

- A joint NCHS/HNIS Coordinating Committee meets quarterly to review and discuss plans for their respective surveys. The committee identified four categories where comparability and coordination could be increased: food composition data, comparability of sociodemographic variables to allow for linking or common analysis of the surveys, methodology for the 24-hour dietary recall, and sampling design.

    * Food Composition Data. NCHS and HNIS agreed to use the HNIS food coding system and nutrient data file in their surveys; NCHS used the HNIS food composition data in Hispanic HANES.

    * Sociodemographic Variables. A joint NCHS/HNIS task force reviewed definitions and wording of sociodemographic and related questions planned for inclusion in NFCS-87 and NHANES III, and when possible, recommended ways to make them uniform or able to be linked for comparability. Incorporation of the task force's suggested modifications would improve the comparability of the two surveys. However, changes in the instruments occurring during the final review and clearance processes may preclude full acceptance of the task force's proposals.

    * Methodology for 24-hour recall. The 24-hour recall method is used to obtain food intake information through personal interviews in

NHANES, NFCS, and CSFII. Efforts are being made to make similar such aspects of the methodology as the questions, the degree of probing, and measurement guides. Some methodological differences may persist, however, because the NHANES includes a complex medical examination component that requires sample persons to attend mobile examination centers for most of the data collection. These mobile examination centers and their staff move from location to location over several years. The NFCS, on the other hand, collects all data in the household, and uses a number of interviewers across the country in one year.

* Sampling Design. Both NHANES and NFCS use stratified area probability samples of households. However, resolution of a number of issues related to the sampling designs, for example, differences in degree of clustering and development of compatible sampling frames, remain unfulfilled objectives of DHHS and USDA. The Departments have made limited progress in these areas.

GOAL B: Improve Information Dissemination and Exchange

B.1. Continue Reporting System to Congress

- The 1981 implementation plan laid out an evaluation and reporting system that would integrate the results of the several NNMS component nutrition activities into common reports. According to the plan, a Joint Nutrition Monitoring Evaluation Committee (JNMEC) sponsored by the OASH-DHHS and the OASFCS-USDA was to develop reports on the nutritional status of the population that would be issued to Congress at three-year intervals.

- The JNMEC was established as a Federal advisory committee in 1983 under the joint chairmanship of the Assistant Secretary for Health, DHHS, and the Assistant Secretary for Food and Consumer Services, USDA. It's report, Nutrition Monitoring in the United States: A Progress Report from the Joint Nutrition Monitoring Evaluation Committee, was transmitted to Congress in July 1986.

B.2. Continue Timely Reporting and Interpretation of Data

Over the past five years the availability and accessibility of data from NCHS and HNIS have increased markedly, as the following examples illustrate.

- Whereas it took six years after survey completion to process NHANES I data, much of NHANES II data collection was processed within two years. Release of data from Hispanic HANES, conducted from 1982 through 1984, was begun within one year, and biochemical and anthropometric data on Hispanics from the Southwest were first presented in November 1985. The first data tapes from all three portions of the survey (Mexican-American, Cuban-American and Puerto Rican) were released in 1987. They included data on dietary practices, body measurements, food frequency, blood and urine assessments, physical examination results, drug use, and medical histories of children and adults.

- NCHS is pilot testing an interactive computerized system for obtaining information on individual food intakes using a 24-hour recall interview. The system will link to HNIS food codes and nutrient data. The system will be used in the NCHS mobile examination centers where the NHANES dietary data are collected, and should substantially reduce the time needed to process the dietary data.

- Reporting of results in published and machine-readable form from CSFII-85 demonstrates HNIS's improved capacity to process and release survey results in a timely manner. Data collection for the first day's intake of CSFII-85 was completed in June 1985, a report of food and nutrient intakes was published in November 1985, and documented public use data tapes were available a few weeks later. The CSFII-85 reports compare 1985 and 1977 (NFCS) information on food and nutrient intakes by women and men 19-50 years and children 1-5 years in the general population and present information about women and children in the low-income population. CSFII-86 reports present similar information for women and young children, including a comparison with intakes reported in CSFII-85.

- An automated system for assigning food codes to foods reported by individuals contributed to the timely processing of CSFII data. It will also be used to process data from individual intakes reported in NFCS-87.

- In addition, an interactive computerized system to assist an interviewer obtain information on household food use and socioeconomic characteristics has been developed and tested. It should reduce the time required to process the household food use data from NFCS-87.

- The CDC surveillance system is characterized by its timely reporting mechanisms. These include (1) monthly and quarterly tabulations and reports that are used by participating State and local clinics to assess and monitor nutritional problems and quality control efforts, (2) special annual analyses and tabulations prepared in collaboration with the States for use in program planning and resource allocation, and (3) an annual publication, Nutrition Surveillance, that presents nutrition-related data collected by State and local health departments in a variety of nutrition and health programs.

B.3. Develop Comparable Reports and Tape Documentation

- The diversity of subject matter, the many possible uses of data, and the range of expertise of users constrain standardization of data outputs. The staff of NCHS and HNIS have made headway in making output from NHANES and NFCS comparable. Some sociodemographic descriptors (e.g., age and race) have been made uniform, and thus more capable of being compared.

- A Standard Reference Nutrient Data Base--a computerized version of updated Agriculture Handbook Number 8 tables--has been issued annually since 1981 for use by researchers with computer facilities. The data base was used to create a special data base for calculating the nutrient content of diets reported in CSFII-85, CSFII-86, and Hispanic HANES; it will also be used in NFCS-87, future CSFIIs, and NHANES III.

B.4. Increase Policy Relevance

Information from the NNMS has been used in the policy arena for a variety of purposes, as summarized below.

Health Policy Development

- In response to minority health initiatives of DHHS, NCHS conducted the Hispanic HANES. Hispanic health researchers, especially, had expressed a need for data more relevant to their goals. Their concerns were incorporated into the design and conduct of the Hispanic HANES. NCHS maintains a continuing interactive mechanism with them to assure that tapes and other data outputs are structured in ways that serve these users best.

- In support of the Public Health Service's development of national measurable health objectives, which include nutrition as one of 15 priority areas, NCHS designed supplements to its 1985 Health Interview Survey (NHIS) to obtain data on disease prevention and health promotion. Data from other NNMS surveys and surveillance activities have also been used to track progress toward meeting the 1990 National Health Objectives (DHHS/PHS, 1986).

Food Assistance Programs

- Federal food assistance programs also rely on NNMS data as the following three examples illustrate.

    * Results from studies of the association of diet quality with participation in the Food Stamp Program and in the School Lunch and School Breakfast Programs were useful in policy decisions related to the food assistance program.

    * The association of diet quality with targeting of the Food Stamp Program was shown using CSFII data: households receiving food stamps were found to be clearly more "needy" than households eligible for but not receiving food stamps; despite their lower income, individuals from food stamp households fared as well or better nutritionally.

    * Food intake and price data from NFCS-77 formed the research basis for the 1983 revision of the Thrifty Food Plan--the legal standard for benefits in the Food Stamp Program. A computerized model that minimizes deviation from food consumption patterns of low-income households while meeting nutritional specifications at given costs is used to form the food plan.

Nutrition Education and Information Dissemination

- Dietary and biochemical data from NCHS and HNIS surveys have been useful to HNIS, the Food and Nutrition Service (FNS), Extension Service (ES), FDA, NIH, and others in planning nutrition education and information programs. For example, NFCS-77 data have been used to show how the nutritional content of diets is associated with food shopping and money management practices, meal patterns, food eaten away from home, use of convenience foods, and addition of iron and B-vitamins through enrichment and fortification of grain products. Problem nutrients identified through the surveys are also included as a focus of nutrition education programs.

- Quantitative dietary recommendations proposed by various organizations have been compared to dietary patterns reported by CSFII sample persons. These comparisons have identified food selection changes that would be necessary to achieve the proposed recommendation, thus providing an indicator of the practicality of a recommendation. Within segments of the population, the nutrient intake of those achieving a given recommendation can be compared with those who do not. Such information is important for the design of practical food selection guides and nutrition education strategies.

- Results of surveys conducted by NIH on health practices and beliefs of professionals and the public have been important to the development of nutrition education materials and information dissemination to the public on various nutrition topics such as heart disease, cancer, etc. For example, the Cholesterol Awareness Surveys and others related to hypertension have been instrumental to the development of nutrition education materials for the National Cholesterol Education Program and the National High Blood Pressure Education Program.

- Information from FDA's periodic surveys of public attitudes, knowledge, and practices are useful in formulating education efforts. These surveys also obtain support from NIH.

- Also useful for education efforts (and applicable to food safety) is FDA's regular national probability survey of consumers that measures intake of dietary supplements, and also identifies intake-related attitudes, knowledge, and lifestyle practices. The intake part of the survey was updated in 1986 as a part of NCHS's National Health Interview Survey (NHIS).

Food Production and Marketing

- CSFII results that identify consumer shifts in commodity selection have been useful to USDA and others in formulating food production and marketing policies. For example, the recent decline in meat consumption, especially in high-income households, has emphasized the need for meat producers and marketers, who customarily link demand with price, to develop and market meat products that are more acceptable to the consumer.

- Food supply estimates and food consumption and dietary status measures from NFCS and CSFII were used by the National Research Council's Board on Agriculture to identify targets for technological options for the production and marketing of animal products.

Food Safety and Regulation

- FDA is a major user of data from the NNMS to evaluate and implement nutrition policy relative to its regulatory functions in a variety of areas: nutrient fortification of the national food supply, nutrition and ingredient labeling, food and nutrient safety, and foods for special dietary use. A recent example of its activities in this area is the convening of expert panels, under an FDA contract, to evaluate the vitamin A, iron, zinc, and folate status of the U.S. population.

- Estimates of intake of various contaminants and nutritional elements obtained as part of the Total Diet Study have helped FDA monitor the safety of the U.S. food supply, and intervene accordingly with regulatory and educational efforts to safeguard the public's health.

- FDA's FLAPS, in conjunction with consumer attitude and awareness surveys, has permitted assessments of the value of nutrition labeling. This activity has also permitted early identification of new fortification practices by industry. As part of the same FLAPS survey, FDA has maintained a surveillance program for nutrition labeling that has enabled FDA to assure necessary levels of accuracy of label values and to identify segments of the industry which warrant encouragement.

- The Environmental Protection Agency's system for the assessment of dietary exposure to pesticides has used NFCS-77 data for four seasons as the basis for its food consumption assumptions. The system will be updated using NFCS-87 data.

B.5. Improve Information Exchange Between Data Users and Generators

The Departments recognize that users who are informed about the survey designs methodologies, and their strengths and weaknesses, are prerequisite to full application of NNMS data. Equally important is learning about data needs of users. As summarized below, the Departments undertook a variety of activities during the implementation phase to foster such information exchange.

- Through published articles, talks at professional meetings, conferences, special workshops, and personal contacts, staff at NCHS and HNIS have given guidance in the use of survey data for a wide variety of purposes and have attempted to determine priority needs of data users.

- HNIS and NCHS cosponsored a comprehensive review of uses of national survey data on food consumption that was conducted by a committee of the National Research Council's Food and Nutrition Board (National Research Council, 1984). The committee's report described a multiplicity of users in government, the academic community, and industry, and included recommendations for increasing the survey's responsiveness to users' needs. The report's findings and recommendations have been considered in planning for the surveys.

- In designing NFCS-87 and NHANES III, HNIS and NCHS, respectively, established formal mechanisms for determining data needs of professionals from scientific, business, agricultural, and health sectors.

- National Nutrient Data Bank Conferences have been held annually since 1976. Their purpose is to identify needs of nutrient data users, to provide recent information on food composition and sampling and analytical procedures to data users, and to demonstrate proper uses of the data for a variety of purposes.

- Through nine cooperative agreements with universities, HNIS in 1986 encouraged the use of CSFII data in investigator-initiated studies of determinants of dietary practices and nutritional content of diets. These cooperative studies have strengthened understanding of needs of data users and generators, while expanding the number of experienced data users and uses of the data.

- The NHANES Users Group has been meeting twice a year since 1981. The group, which is coordinated by FDA and NCHS, is open to any researcher using or planning to use NHANES data. There are about 120 members. The meetings allow researchers to informally exchange their ideas, problems, and results, and allow NCHS staff the opportunity to brief researchers about recent NCHS developments.

- Two national and two regional workshops for State public health and food program leaders, sponsored by the Association of State and Territorial Public Health Nutrition Directors (ASTPHND), were held between 1985 and 1987. Their purpose was to show how states can use NHANES and NFCS/CSFII data.

- To help specify its needs as a user of data on nutrient adequacy and toxicity, FDA contracted with the Life Sciences Research Office (LSRO) of the Federation of American Societies for Experimental Biology (FASEB) to convene an ad hoc expert panel to recommend assessments of nutritional status and health conditions for possible inclusion in NHANES III. The panel examined indicators of status and, when applicable, excess accumulation, for 21 selected nutrients and health conditions, and identified feasible methodologies for use in a large-scale, cross-sectional survey. A report of the recommendations was published in 1985.

GOAL C: Improve the Research Base for Nutrition Monitoring

A limited amount of methodological research in nutritional status assessment, food consumption measurement, and food composition measurement was undertaken during the implementation phase that specifically addressed monitoring needs, i.e., was of direct relevance to the conduct of surveys or surveillance activities. In addition, DHHS and USDA undertook a broad array of research activities that had components applicable to nutrition monitoring activities even though nutrition monitoring was not the initial reason for doing the research. Examples of research related to the specific categories of measurement of monitoring system activities are outlined in the following bullets.

Methods for Nutritional Status Assessment

- NIH and ARS have undertaken extensive research related to nutritional status assessment and nutritional requirements. For example, ARS's Human Nutrition Research Centers have provided information about nutrient requirements throughout the lifecycle that is basic to dietary standards development and to relating dietry intake to nutritional risk. NIH Clinical Nutrition Research Units (CNRU) and centers have contributed especially to understanding the effects of disease states on nutritional status. Nutritional status assessment has been studied in healthy and clinical populations as well as high-risk groups. Such studies have examined (1) biochemical, anthropometric, maturational, and functional indices of nutritional status, (2) micromethods employing the latest technology and the smallest amounts to measure nutrient concentrations in various tissues and plasma, and (3) methods that improve the accuracy of dietary intake data. These agencies, as well as FDA and CDC, are also working on developing assessment methods that may be applicable to large-scale surveys. For example, CDC has developed more specific and reliable methods for the analysis of vitamins A and E and serum iron using very small samples.

- Long-term prospective studies on specific high-risk populations are underway at NIH and at ARS's Human Nutrition Research Centers. For example, the ARS Human Nutrition Research Center on Aging at Tufts University conducted a nutritional assessment of noninstitutionalized and institutionalized elderly in the Boston Area. Insights about nutrition and the aging process have also been gained from the NIH National Institute on Aging's Gerontology Research Center in Baltimore. These studies, which are unique because of their long-term perspective, provide insights about potential vulnerable groups, indicators, and standards that are useful for the monitoring system's endeavors.

- Conferences have also been used to explore ways to make better use of research data generated and to further collaborative efforts and information exchange. The biennial conferences of federally-supported human nutrition research units and centers are illustrative. The most recent conference was held in February 1987, and focused on nutritional status assessment and dietary intake methodology. A summary report will be published.

Food Consumption Measurement

- Methodological research on dietary intake assessment sponsored by HNIS since the mid-1970s has been reported at professional meetings and will soon be published in a single report. The research has included (1) an evaluation of elements of reporting error in food and beverage intakes collected using NFCS-77 procedures, (2) a comparison of 24-hour dietary recalls collected from male volunteers and from knowledgeable members of each household with information from unobtrusive observers, (3) a comparison of dietary intake and anthropometric data collected in NHANES I and NFCS, and (4) an evaluation of the applicability of nine alternative dietary intake methods for assessing the dietary status of the population through longitudinal and periodic surveys. In the last category, the best methods found were evaluated for use with several low-income populations.

- To provide improved standards for evaluating nutrient levels of diets reported in NFCS and other dietary studies, HNIS sponsored a major study by a committee of the National Research Council's Food and Nutrition Board to determine risk of nutrient deficiency at given levels below the Recommended Dietary Allowances. The committee's report, Nutrient Adequacy: Assessment Using Food Consumption Surveys, proposed a probability approach to measure risk in the populations surveyed (National Research Council, 1985. With the possible exceptions of iron and protein, however, the data on nutrient requirements needed for its use are not yet available.

- The ARS Human Nutrition Research Center at Beltsville, Maryland with some support from NIH, has continued its work on development of automated analytic techniques for direct analyses of food and improved methods for collecting, recoding, and evaluating dietary data. NIH-supported clinical trials and epidemiological studies have provided the opportunity to develop, test, and refine methods for measuring nutrient intake in populations.

- In 1986 FDA contracted with LSRO/FASEB for a review by an expert panel of appropriate uses of dietary intake data. The final report, released in 1987, provides guidelines for dietary data analysis and interpretation.

Food Composition Measurement

- The USDA Nutrient Data Bank (NDB) continues to be expanded with nutrient data from a variety of sources including academia, industry, and agency-sponsored research. For example, a nutrient data base of 28 food components in over 4,500 foods reported in surveys conducted in 1984-1986 was developed by a new automated system for use in the CSFII and Hispanic HANES. It is also available to the public.

- Food consumption data from CSFII-85 were used to identify data gaps in the Nutrient Data Base for major food contributors of nutrients. A study to supply these missing nutrient values has been proposed.

- Revision of Agriculture Handbook No. 8, Composition of Foods... Raw, Process, Prepared, is proceeding by food groups. Of the 23 sections planned, 16 have been published and others are in process.

- Since 1974, NIH has supported food composition data acquisition and research on improved methodology through interagency agreements with the HNIS Nutrient Data Research Group (which maintains the Nutrient Data Bank) and the ARS Nutrient Composition Laboratory (NCL). This support has greatly increased the availability of data on nutrients associated with chronic diseases, including heart disease and cancer.

- The ARS Nutrient Composition Laboratory has developed improved analytical methods for fatty acids, trace minerals, sugars, and vitamin B6, and has begun applying these methods in food analyses. New methods are being developed for carotenoids, B and C vitamins, and plant sterols.

- NIH and HNIS support research to develop methods of analysis for dietary fiber and carotenoids in foods, as well as to conduct the analyses. FDA has contributed to the research needed in these areas by coordinating collaborative efforts to define an official method of analysis for "total dietary fiber," which has been accepted by the Association of Official Analytical Chemists. Further work is underway to develop methods that will distinguish soluble and insoluble fiber.

- FDA and USDA, through frequent consultation, have encouraged industry to extend their analyses to nutrients not presently declared on nutrient labels.

- In response to a Congressional mandate, FDA and the Infant Formula Council coordinated a multi-phase collaborative study to develop appropriate methods for analysis of nutrients in infant formulas. Canadian and British government and food industry laboratories have participated in the project. More than 17 methods have been verified and approved for milk-based ready-to-feed formulas.

- A contract to establish an International Network of Food Data Systems (INFOODS) has primary support from the NIH with contributing support by FDA and USDA. The intent of this system is to improve the quality, availability, and exchange of food composition data on an international basis. Since this effort began in 1983, progress has included establishment of regional INFOODS liaison groups; an international directory of food composition data bases; a publication, the Journal of Food Composition and Analysis, which begins publication in 1987; and a publication on standards and guidelines for analysis and data base construction.

Dietary Knowledge and Attitude Assessment

- NCHS and HNIS surveys have provided a limited amount of information to improve the research base in this area. NIH and FDA, who have been most active in this area during the past five years, have contributed insofar as they address their individual mandates.

CHAPTER III

PROPOSED ACTIVITIES FOR THIS OPERATIONAL PHASE - 1987-1996

This section outlines activities that will be undertaken to achieve the goals set forth in the first chapter. A chronological calendar of events covering 1987 through 1996 is included to give a clearer picture of the temporal relationship of these activities.

GOAL A. Achieve a Comprehensive System Through Coordination Among NNMS Components

A.1. Include All Appropriate Nutrition Monitoring Activities

- This is a most important goal if the NNMS is to reach its full potential. As a first step, the Deputy Assistant Secretaries for Food and Consumer Services, USDA, and for Health (Disease Prevention and Health Promotion), DHHS, are overseeing the preparation of an inventory of Federal surveys and surveillance activities related to food, nutrition, and nutrition-related health conditions, for release in spring 1988.

- The activities comprising the inventory will be used as the basis for efforts to integrate and coordinate the relevant information sources. Initial efforts will concentrate on integrating DHHS and USDA surveys.

- To facilitate achievement of this goal, the Departments are exploring ways to strengthen interagency coordination. Options being considered include the establishment of an interagency coordinating committee on nutrition monitoring or broadening the scope of the Interagency Committee on Human Nutrition Research (ICHNR) to include nutrition monitoring activities beyond monitoring research. It is anticipated that a more formal interagency coordinating function on nutrition monitoring will be in place in 1988.

A.2. Improve Coverage of Major Population Groups at Risk

- An assessment of DHHS efforts to monitor the nutritional status of low-income populations is nearing completion. The study report, due in August 1987, focuses on provision of national level data and will identify gaps in coverage of nine broad low-income target populations: pregnant and lactating women, infants and preschool children, school-age children, adolescents, adults, nursing home residents, other elderly, native Americans living on reservations, and the homeless. Options for alleviating the identified gaps will also be proposed. The inventory of Federal monitoring activities described earlier in this chapter (Goal A.1.) will be useful for identifying gaps in population coverage beyond DHHS.

- As specific target groups are identified, the collective agencies will develop plans for the most effective way to provide data on the dietary and nutritional status of these groups. These may include special surveys for hard to reach groups, expansion of the Coordinated State Surveillance System, and use of follow-up surveys.

- Some gaps are well recognized and already being remedied. For example,

    * NHANES III will extend its coverage beyond the 75 year old cap used in NHANES II. In addition, the elderly will be oversampled in NHANES III as will blacks, Hispanics, and the very young.

    * The design used for CSFII-85 and CSFII-86 will be modified in 1989 and beyond to cover all sex-age groups. Results will be reported annually on a moving average basis. In addition, CSFII will target populations for detailed, extensive dietary status data. For example, the 1990 CSFII is planned to provide a special sample of elderly along with the all income and low-income samples. The decennial NFCS also continues to include a special sample of low-income households.

- In response to a Congressional mandate to assess the feasibility of developing a hospital-based system for identifying cases of severe undernutrition among low-income, high-risk children, CDC will establish pilot projects in at least two States. Efforts will be made to assist States (1) to develop and evaluate the feasibility of a population-based surveillance system (including hospital sources of cases) that identifies children with severe undernutrition; (2) to collect and analyze information on prevalences, etiologies, and risk factors; and (3) to facilitate appropriate intervention for children who are identified as severely undernourished.

A.3. Improve Temporal Coverage

- Future nutrition monitoring activities are planned so that a national population survey or surveillance activity is collecting data every year from 1987 through 1996. This will provide a mechanism for the continuous monitoring of dietary and/or nutritional status of the U.S. population. The planned activities by year are shown in Table 1.

A.4. Improve Comparability Among Surveys

- Within DHHS and USDA, working groups will devise solutions to ensure maximum comparability among core surveys while retaining the surveys separate objectives. These groups will continue to address specific issues related to comparability among the core surveys in the following areas: dietary recall methodology, specific sociodemographic variables, food composition data base, and sample design. CSFII will provide the opportunity to test various new techniques that could be incorporated into the next round of major surveys to improve comparability.

Table 1. Nutrition Monitoring Activities: Temporal Coverage*

Year	Diets		Nutritional Status		Food Supplies and Systems			Diet Know./Attitudes**		
	NFCS	CSFII	NHANES III***	CSSS	TDS****	Disappearance	FLAPS	HDS	NHIS	CSFII
1987	X			X	X	X		X	X	
1988	X		X	X	X	X	X			
1989		X	X	X	X	X		X		
1990		X	X	X	X	X	X		X	X
1991		X	X	X	X	X		X		X
1992		X	X	X	X	X	X			X
1993		X	X	X	X	X		X		X
1994		X	X	X	X	X	X			X
1995		X		X	X	X		X	X	X
1996		X		X	X	X	X			X

*Diets: **NFCS** = Nationwide Food Consumption Survey (USDA/HNIS); **CSFII** = Continuing Survey of Food Intakes By Individuals (USDA/HNIS);

Nutritional Status: **NHANES III** = Third National Health and Nutrition Examination Survey (DHHS/NCHS); **CSSS** = **CDC Cooperative State Surveillance System:** Pediatric and Pregnancy Nutrition Surveillance Systems; also Behavioral Risk Factor Surveillance System (DHHS/CDC);

Food Supplies and Systems: **TDS** = Total Diet Study (DHHS/FDA); **Disappearance** = Estimates of per capita food and nutrient supplies at or before retail (USDA/ERS, HNIS); **FLAPS** = Food Labeling and Package Survey (DHHS/FDA);

Dietary Knowledge and Attitudes: **HDS** = Health and Diet Survey (DHHS/FDA); **NHIS** = National Health Interview Survey Supplements (DHHS/NCHS); **CSFII** = Follow-up, Consumer Perceptions Survey (USDA/HNIS,FSIS AND DHHS/FDA).

**NIH supports dietary knowledge and attitude surveys directed towards current research needs such as the Cholesterol Awareness Survey.

***NHANES III will also provide quantitative assessments of nutrient intake from foods and from vitamin and mineral supplements.

****The Total Diet Study also estimates the intakes of various organic and elemental contaminants and nutritional elements in representative diets of specific age-sex groups. Currently 234 foods are collected, prepared for consumption, and analyzed.

- USDA and DHHS plan to examine the additional monitoring activities of the two departments beyond NHANES and NFCS for comparability with these two surveys. Where possible, specific changes in these activities will be recommended to increase comparability and enhance the usefulness of the results. For example, HNIS, the USDA Food Safety and Inspection Service (FSIS), and FDA plan to conduct a follow-up survey of CSFII-89 participants to assess their knowledge and attitudes about selected diet and health issues. This survey, the Consumer Perceptions Survey, will make possible for the first time a comprehensive examination of the links between attitudes about diet and health and food consumption behavior based on a national sample. Where this comparability among surveys is not feasible, an attempt will be made to understand the effect of the differences on the interpretation of the data bases. Consideration of data bases beyond DHHS and USDA is also anticipated, following the initial departmental effort.

- USDA has established an in-house working group to identify sampling design, analyses, and variables that are most appropriate for hypothesis testing, while considering the need for comparability with past NFCS and coordination with NHANES and other surveys in the system. Expert panels may be utilized to handle difficult questions particularly in the area of the sampling plan. Information assessed will include National Survey Data on Food Consumption: Uses and Recommendations (National Research Council, 1984) and Nutrition Monitoring in the United States: A Progress Report from the Joint Nutrition Monitoring Evaluation Committee (DHHS/USDA, 1986).

GOAL B. Improve Information Dissemination and Exchange

B.1. Continue Reporting System to Congress

- The second (1989) comprehensive report on nutrition monitoring will build on the framework established by the first report, Nutrition Monitoring in the United States: A Progress Report from the Joint Nutrition Monitoring Evaluation Committee, issued in 1986. It will include the following components:

  (1) An update of the dietary and nutritional status of the U.S. population;

  (2) An in-depth analysis of the capabilities of the NNMS to assess the status of people using NNMS health data, emphasizing nutrition factors in cardiovascular disease, and dietary data, focusing on iron intake. This analysis will look in particular at populations at risk, limits to interpretation of data, gaps in the data base, trends, and factors influencing nutritional status; and

  (3) Recommendations for strengthening the NNMS.

- The report will draw primarily on data released by DHHS and USDA since the first report, and may include other sources of data, such as the Bureau of Labor Statistics Consumer Expenditure Survey and the Bureau of the Census Survey of Income and Program Participation.

- Scientific evaluation and interpretation of data to provide the basis for the Departments' report will be obtained through a contract with an independent, scientific organization. Executive secretariat responsibility for the 1989 report rests with DHHS, and has been delegated to NCHS.

B.2. Continue Timely Reporting and Interpretation of Data

- Emphasis on timely release of data from NNMS activities will remain a primary objective. Data will be available in data tape as well as hard copy form.

- NCHS will complete release of data tapes with Hispanic HANES data in 1987. Subjects will include: dental data from all three portions of the survey (Mexican-American data were released in 1986), diabetes, gallbladder disease, and 24-hour dietary recall data.

- HNIS will complete release of data tapes and published reports of results on dietary status from CSFII-85 and CSFII-86 in 1987. Data from NFCS-87 on individual diets and on household food use and food cost will be released beginning in early 1988.

B.3. Develop Comparable Reports and Tape Documentation

- Joint USDA/DHHS working groups will work to develop common report and data tape documentation formats, data categories, and data arrays (e.g., tables). Such information will be shared with other contributors of NNMS data. Suggestions from organizations such as the Association of State and Territorial Public Health Nutrition Directors (ASTPHND) will be solicited.

- Efforts will be increased to present data in reports in ways to facilitate comparisons, such as presenting data in identical age ranges. Text in reports will also be included that facilitates statistical analyses and interpretation of data (e.g., possible design effects, coding rules and assumptions applied to the estimation of "unknowns," and other analytic procedures).

- Tape documentation presented for survey data will include information related to survey design (e.g., sample person selection, response rates, weighting methods), data collection (e.g., coding of missing values), and description of demographic variables (e.g., age and race).

- Data users conferences will include sessions or other structured opportunities specifically designed for giving and taking suggestions on improving the comparability of reports and tape documentation.

B.4. Increase Policy Relevance

- DHHS and USDA will increase interdepartmental and intradepartmental communication regarding policy issues and data needs related to these issues. The Departments recognize the need for a more concerted effort in this area so that the NNMS can provide the most useful information for decision-making to improve nutrition. Currently, agencies with major responsibility for nutrition monitoring solicit input from the regulatory, program, and research units during development of surveys and analysis plans for survey data. This process will be expanded to cover a broader range of monitoring activities and will emphasize interdepartmental issues. Coordination of this effort will be the responsibility of the Assistant Secretaries for Health (DHHS) and Food and Consumer Services (USDA).

- USDA will sponsor cooperative research with universities to use NNMS data to address issues relating to its programs in agriculture, food assistance, and nutrition education.

- DHHS's Nutrition Policy Board and USDA's Subcommittee on Human Nutrition will continue to serve as the mechanisms for raising, reviewing, and making recommendations about important policy issues within each Department. All agencies with interest and activities in nutrition are represented on these boards.

- In addition, suggestions about ways to increase the relevance of nutrition monitoring data for policy decisions will be solicited from departmental advisory groups such as the U.S. National Committee on Vital and Health Statistics and USDA's Board of Human Nutrition Scientific Counselors.

- Additional organized contact with Congress through more frequent updates on monitoring activities and findings may also be adopted. Congressional needs for NNMS data interpretation for policy decisions will continue to be considered in the preparation of the required reports to Congress on nutrition monitoring.

- Formal meetings of users, such as the NHANES Users Group meetings, the Nutrient Data Bank Conferences, and meetings of the Association of State and Territorial Public Health Nutrition Directors and the State Cooperative Extension Service Nutrition Specialists will be organized, where practicable, to encourage exchange of information on the real and potential policy value of data from NNMS component activities.

- Data from the NNMS will continue to serve as an integral component of the process of tracking progress toward meeting the 1990 National Health Objectives and in the development and subsequent tracking of National Health Objectives for the Year 2000.

B.5. Improve Information Exchange Between Data Users and Generators

Component organizations of the NNMS, especially NCHS and HNIS, will continue to identify and increase the numbers of users and uses of data through education, communication, and technical assistance activities. Public health and Extension Service users at the State and local level will receive special attention. Additionally, means to record and disseminate information on users and uses will be enhanced, as the following examples illustrate.

- Data user conferences will be held periodically to train potential users in effective ways of using data from the NNMS. These may be single agency efforts or efforts jointly sponsored by USDA and DHHS. The goal is to expand the pool of educated data users in research as well as in policy development and planning.

- Feedback will also be solicited from data users, particularly about scientific and methodologic problems, at data user conferences, as well as during workshops, and professional meetings. This information will be used to improve future surveys.

- It is anticipated that the semiannual NHANES Users Group meetings will continue, with FDA and NCHS continuing their coordinating role.

- Federally-supported research on dietary and nutritional status monitoring conducted by various universities provides information useful for NNMS activities. Cooperation and collaboration between the universities and NNMS agencies should serve to expand the pool of experienced data users and increase awareness of the data needs of researchers.

GOAL C. Improve the Research Base for Nutrition Monitoring

NNMS component agencies will strive to enhance the research base for nutrition monitoring. Research needed to facilitate the conduct of food consumption and nutrition surveys will be prioritized and, where appropriate, coordinated. Particular attention will be given to the recommendation of the JNMEC in this regard. Agencies responsible for specific monitoring system components will work formally to achieve this goal through the ICHNR and its Subcommittee on Nutrition Monitoring Research,[1] which was established in January 1987 to update and refine the research agenda for nutrition monitoring, drawing on the Federal five-year plan for nutrition research. The Subcommittee will also review the definition of nutrition monitoring research and clarify its components.

NNMS component agencies will continue their information exchanges with the nutrition research community. The activities put forth to achieve the second goal--improve information dissemination and exchange--will also strengthen the linkages with the nutrition research community.

In addition, agencies responsible for conducting surveys and surveillance activities will continue their ongoing research efforts directed toward specific monitoring issues, especially in the areas of food consumption and food composition measurements. Some examples follow.

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[1] The Subcommittee is co-chaired by the Deputy Assistant Secretary for Health (Disease Prevention and Health Promotion), DHHS, and the Deputy Assistant Secretary for Food and Consumer Services, USDA. Membership comprises representatives of specific nutrition monitoring activities in ARS, CDC, FDA, NIH, HNIS, and NCHS, and ICHNR members from the Agency for International Development, Department of Defense, DHHS, Veterans' Administration, and USDA. Membership will be expanded to include representatives of other Federal monitoring efforts.

Food consumption measurement

- The lead for this area is shared by DHHS and USDA, who will continue to explore various researchable questions identified during the conduct of the national surveys. Such topics include dietary data collection methodology: serving size estimates; food frequency and recall method effects, and effects of probing on responses. The inter- and intra-variability of dietary intake is being studied to provide the understanding needed for improved assessment of diet adequacy.

Food composition measurement

- USDA (HNIS), the lead agency in this area, will maintain large food composition data bases specifically for assessing diets reported in national surveys. These data bases will be revised periodically and documented in ways that facilitate improved comparability of assessments across surveys and with subsequent surveys. Decisions about major additions or changes in the data base will be made by staffs in USDA and DHHS. Such data bases contain values for all nutrients assessed in the survey for all foods reported. Until analyses are available, best estimates will be imputed by HNIS staff. Information to fill gaps will be sought from industry and government laboratories and/or generated by supporting studies to conduct needed analyses.

- A computerized recipe system that documents the formulas assumed for food mixtures is an integral part of the HNIS nutrient data bases. Also, use of this system allows food mixtures reported in surveys to be broken down into their recipe components with their separate nutrient contributions.

- USDA and DHHS agencies will continue to support food composition research to improve data bases. Of special current interest are carbohydrates, especially dietary fiber, and carotenoids. A joint HNIS/ARS effort will provide better nationwide coverage by the Nutrient Data Base of selenium--currently not estimated in American diets because of the scarcity of reliable data and the variability of the nutrient in foods produced in different areas of the country.

- ARS's Nutrient Composition Laboratory will continue to develop new and improved methods for the analyses of nutrients in foods and to use them to provide more accurate and precise food composition data. These efforts receive some of their support from NIH, which also conducts food composition methods research.

- FDA will continue to examine iron bioavailability test methodologies, as well as analytic methods for different forms of fiber and for nutrient analyses of infant formulas and other foods.

- Current tasks of INFOODS will be completed in a year, and future activities and support are being planned.

Calendar of Events

This calendar highlights major activities during this operational phase. Updating is anticipated as plans for the second half of the phase are finalized.

1987	Nutrition monitoring coordination meetings: Quarterly meetings of the Assistant Secretary for Health (DHHS) and Assistant Secretary for Food and Consumer Services (USDA); NCHS/HNIS Coordinating Group; ICHNR (and Subcommittee on Nutrition Monitoring Research)[1]
1987	ICHNR Conference of Federally-Supported Human Nutrition Research Units and Centers.[2] Topics were dietary methodology and human nutrient requirements - February 24 and 25, ICHNR, NIH amd ARS
1987	Completion of CSFII-86, HNIS
1987	Start of NFCS-87, HNIS
1987	Start of NHANES III Pilot Tests, NCHS
1987	Health and Diet Study, Cycle 4, FDA[3]
1987	Nutrient Data Bank Conference[4]
1987	Information released on U.S. Food Supply in terms of food and nutrients, ERS and HNIS[4]
1987	NHANES Users Group, May and October, FDA Coordinates[5]
1987	ASTPHND Data Lab, HNIS, NCHS, FDA, and NIH
1987	HHANES Data Users Workshops in New York and Puerto Rico, NCHS
1987	Total Diet Study, FDA[4]
1987 or 1988	National Health Interview Survey Supplement on Dietary and Other Cancer Risk Factors, NCI and NCHS
1987 or 1988	National Telephone Survey of Weight-loss Practices, FDA and NHLBI
1988 or 1989	National Survey of Infant Feeding Practices, FDA

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[1] Quarterly meetings anticipated throughout this phase
[2] Biennial conferences anticipated throughout this phase
[3] Conducted every 18-22 months throughout this phase
[4] Annually throughout this phase
[5] Semiannual meetings anticipated throughout this phase

1988	Completion of NFCS-87, HNIS
1988	Release of Nutrient Data Base for Household Food Use, Release No.2., and Nutrient Data Base for Individual Intake Surveys, Release No. 4 (to be used in calculating nutrients in NFCS-87), HNIS
1988	Workshops for users of NFCS data, HNIS
1988	Start of NHANES III, NCHS
1988	Food Label and Package Survey (FLAPS), FDA[2]
1989	CSFII of general and low-income populations, each year 1989 through 1996, HNIS. Follow-up Consumer Perceptions Survey, HNIS, FSIS, and FDA
1989	Completion and forwarding to Congress of second NNMS report, DHHS/USDA
1990	Special survey of elderly persons with CSFII, HNIS
1990	National Health Interview Survey Supplement on Health Promotion and Disease Prevention Practices, NCHS
1991	Pilot test of new dietary survey procedures based on CSFII and NFCS-87 experience and methodology research
1991	Completion of NHANES III-Cycle 1 (first of two cycles), NCHS
1992	Completion and forwarding to Congress of third NNMS report, DHHS/USDA
1994	Completion of NHANES III - Cycle 2, NCHS
1995	Completion and forwarding to Congress of fourth NNMS report, DHHS/USDA
1995	National Health Interview Survey Supplement on Health Promotion and Disease Prevention Practices, NCHS

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[1] Quarterly meetings anticipated throughout this phase
[2] Biennial conferences anticipated throughout this phase
[3] Conducted every 18-22 months throughout this phase
[4] Annually throughout this phase
[5] Semiannual meetings anticipated throughout this phase

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APPENDIX 1

OVERVIEW OF DHHS AND USDA NUTRITION MONITORING SURVEYS AND SURVEILLANCE ACTIVITIES

DHHS and USDA surveys, surveillance activities, and related nutrition research and program activities are summarized below, and listed in the table at the end of this appendix, in relation to the five categories of measurement:

A. Health and nutrition status measurements
B. Food consumption measurements
C. Food composition measurements
D. Dietary knowledge and attitude assessment
E. Food supply determination.

A. HEALTH AND NUTRITIONAL STATUS MEASUREMENTS

- **National Health and Nutrition Examination Survey (NHANES)**: The NHANES, conducted periodically by the National Center for Health Statistics (NCHS), is the cornerstone of Federal efforts to monitor the overall nutritional status of the American people. NHANES consists of a series of surveys of probability samples of the United States population comprising over 20,000 persons each.

The surveys include physical examination, anthropometry, blood cell assessments, biochemical analyses of blood and urine, x-rays, functional assessment, health histories, and dietary intake interviews. They provide national estimates of diseases and health and nutritional characteristics of the U.S. population and selected subgroups. For example, through NHANES, physical and biochemical measurements are made which provide information about a number of nutrition-related conditions, including growth retardation; anemia; obesity; heart disease; hypertension; cerebral vascular disease; diabetes mellitus; vitamin, mineral, and trace element deficiency or toxicity; and heavy metal and pesticide exposures.

Two national surveys have been completed--NHANES I (1971-1974, ages 1-74 years) and NHANES II (1976-1980, ages 6 months-74 years). A third, NHANES III (1988-1994), is scheduled to begin in September 1988. Data will be collected on persons 2 months and older. Special sampling of infants, children, the elderly, and minority groups such as blacks and Hispanics will permit reliable estimates of the health and nutritional status of those groups. A survey for Hispanic Americans, HHANES, was conducted from 1982 through 1984. The HHANES had three components: Mexican Americans in the Southwest (about 9,900 persons sampled), Cuban Americans in the Miami, Florida area (2,300), and Puerto Rican Americans in New York City (3,800).

- **Other NCHS Surveys**: In addition to NHANES, a number of NCHS surveys and record systems provide important information for assessing the health effects of nutritional status. These include the National Health Interview Survey, NHANES I Epidemiologic Followup Study, National Natality Survey, National Survey of Family Growth, National Maternal and Infant Health Survey, and Vital Statistics System. These surveys are briefly described in the following paragraphs.

The National Health Interview Survey (NHIS) collects data on the incidence of illness and injuries, prevalence of chronic diseases and impairments, disability, physician and dental visits, hospitalizations, and other health topics, as well as on the relationships between demographic and socioeconomic characteristics and health status. The data are obtained from household interviews with a sample of the Nation's civilian, noninstitutionalized population; the survey is conducted annually. In addition, each year special health topics (supplements) are included. Recent and planned supplements particularly relevant to nutrition monitoring include disease prevention and health promotion (1985 and 1990), vitamin and mineral supplement use (1986), and cancer control (1987).

The NHANES I Epidemiologic Followup is a nationwide followup interview survey conducted in 1982-1984 of approximately 14,000 persons who participated in NHANES I. Respondents were asked about their health and hospitalization history, measurements of weight and blood pressure were taken, and household data were augmented by data from hospital records and death certificates. Continued followup of the study's elderly cohort was conducted by telephone in 1986. In 1987, contact is to be made with the full sample by telephone.

The National Survey of Family Growth provides data on family planning practices and attitudes, factors influencing trends, and differences in fertility and related aspects of maternal and child health. For example, it has produced information on frequency and duration of breast-feeding. The first two cycles of the survey were conducted in 1983 and 1976 with a sample of ever-married women ages 15-44. The survey will be fielded again in 1987. Data are collected through household interviews.

The National Maternal and Infant Health Survey, planned for 1988, has three components covering natality and fetal and infant mortality. Live birth, fetal death, and infant death records will be sampled and questionnaires sent to mothers and physicians, hospitals, and other medical care providers used by the mother. The major areas of investigation are causes of low birth weight infants and infant deaths; prenatal care; the effects of maternal smoking, drinking, and drug use; the effects of sexually transmitted diseases on pregnancy outcome; and the use of public maternal health programs by mothers and infants. The 1988 survey will be a combination of three earlier surveys--the National Natality Survey (1980), the National Fetal Mortality Survey (1980), and the National Infant Mortality Survey (1964-66).

The National Mortality Survey is designed to provide data on socioeconomic characteristics of deceased persons, use and payment for hospitals and institutional care during the patient's last year of life, and factors associated with health status, such as smoking habits. The data are collected with the use of questionnaires sent to the decedents' next of kin and to the institutions which provided health care, including hospitals, nursing homes, hospices, and other facilities. The survey was conducted annually from 1961 through 1968 and most recently in 1986.

The Vital Statistics Program is responsible for the nation's official vital statistics. Based on records filed in State vital statistics offices, the national program coordinates reporting, coding, and transmission of data on births, deaths, fetal deaths, induced terminations of pregnancy, marriages, and divorces. The vital statistics program produces annual data for the United States and for States, counties, and other local areas, and monthly provisional data for the United States and each State.

- **Coordinated State Surveillance System (CSSS)**: The Division of Nutrition, Center for Health Promotion and Education, Centers for Disease Control contributes to nutrition monitoring through the Coordinated State Surveillance System, which monitors the nutritional status of high-risk pediatric and pregnant populations through the collection of measurements readily available such as height, weight, hemoglobin and/or hematocrit. The system utilizes information from service delivery programs operated by participating State and local health jurisdictions and from the DHHS Bureau of Health Care Delivery and Assistance of the Health Resources and Services Administration (HRSA) to provide data on the prevalence of major nutritional problems in the targeted groups. The groups under surveillance are not a representative sample of the U.S. population, but are usually children and pregnant women from low-income families who voluntarily attend publicly-supported health and nutrition programs in States that participate in the CSSS. The CSSS provides information about the prevalence of overweight, underweight, retarded linear growth, and anemia among high-risk children. Among pregnant women, surveillance data are collected in regard to anemia, abnormal weight changes, fetal survival, birth weight of the child, and whether breast or bottle feeding is used and for how long. In 1986, 34 States, the District of Columbia, and Puerto Rico participated in the Pediatric Nutrition Surveillance System, and 14 States, the District of Columbia, and Puerto Rico participated in the Pregnancy Nutrition Surveillance System.

- **Behavioral Risk Factor Surveillance System (BRFSS)**: The BRFSS, initiated by CDC in 1984, is a State-based system that routinely collects data on the prevalence of behavioral risk factors associated with premature death and disability. These include nutrition-related risk factors such as obesity, hypertension, excessive alcohol consumption, and lack of physical exercise. In 1987 the BRFSS extends to more than 30 states and provides State-specific results which can be used for program planning and monitoring of trends.

- **Health Service Programs**: Nutritional assessment using height and weight measurements as well as hemoglobin or hematocrit determinations is undertaken directly through such DHHS health service delivery programs as Maternal and Child Health, Primary Care Programs (Rural-Urban), Migrant Health, and Indian Health Service programs administered by the Health Resources and Services Administration; the Early and Periodic Screening Diagnosis and Treatment (EPSDT) Program administered by the Health Care Financing Administration; and Head Start administered by the

Administration for Children, Youth and Families of the DHHS Office of Human Development Services. Data from these assessments are used primarily to determine protocols in the treatment of individuals.

Data from publically-funded food assistance, nutrition, or health service programs in participating States are provided on an ongoing basis to CDC's CSSS. Guidelines on prevention, screening, and follow-up of the nutritional disorders of children have been widely disseminated to health care providers in the private sectors by the Office of Maternal and Child Health, HRSA, as were publications to improve clinical care criteria for data collection and monitoring in private and public sites.

- **Nutrition Research Programs Related to Health and Nutrition Status Assessment**: As Contributors to the NNMS--As explained in the text, limited efforts are specifically directed toward the development of improved methods for the regular evaluation of nutritional status of populations and the conduct of surveys, i.e., to nutrition monitoring research. A variety of agencies, however, support other research efforts that contribute to the knowledge base for nutrition monitoring. These research efforts are explained in recent National Institutes of Health (NIH) and Department of Agriculture (USDA) publications (NIH, 1986; USDA, 1986). The publication, Human Nutrition Research: The Federal Five-Year Plan, which was submitted to Congress in 1986, summarizes the types of nutrition research conducted by the agencies of the Federal government and identifies six priority research areas. Topics relevant to nutrition monitoring are found in each of the six areas (ICHNR, 1986).

DHHS's NIH and USDA's Agricultural Research Service (ARS) are the major Federal contributors to research on nutritional status and epidemiological nutrition research. Within NIH, such research is sponsored by several of the individual institutes, including, the National Cancer Institute (NCI); National Heart, Lung, and Blood Institute (NHLBI); National Institute on Aging (NIA); National Institute on Child Health and Human Development (NICHD); National Institute on Diabetes, Digestive and Kidney Disease (NIDDK), as well as through its Clinical Nutrition Research Units (CNRU) and centers.

Investigator-initiated nutrition research constitutes the largest single area of NIH support; however, NIH supports numerous centers which provide core research support in addressing multidisciplinary biomedical problems which in turn provide an important stimulus to such investigator-initiated research. The NIH Clinical Nutrition Research Units are specific centers that are oriented to human nutrition research in health and disease. They serve as the focal point for clinical nutrition research activities, including on the relationship of nutrient intake and bioavailability to physiological function, assessment of nutritional status and body composition, and factors which influence these measures in health and disease.

ARS contributes principally to research on nutritional requirements and nutritional status through its five Human Nutrition Research Centers. In particular, the Western Human Nutrition Research Center at Letterman Army Institute of Research, San Francisco, California, conducts research on human nutrition requirements and on nutritional status, surveillance, intervention, and monitoring. The Center focuses on (1) identification of factors, forces, and trends resulting in malnutrition; (2) development of reliable, efficient, and inexpensive methods for defining nutritional status; (3) studies on nutritional requirements; and (4) development of nutritional criteria and methodologies to assist in design and evaluation of action programs.

Two of the centers focus on specific age groups of the population. The Children's Nutrition Research Center in Houston, Texas, is dedicated to the study of nutritional needs of pregnant and lactating women and of infants and children, with particular attention to the quantification of nutritional allowances and the attainment of optimal nutritional status. The Human Nutrition Research Center on Aging at Tufts University in Boston focuses on the nutritional requirements of the elderly, the role of nutrition in the aging process, and the prevention of diet-related disorders.

The remaining two centers have established research programs in nutritional requirements and status. The Beltsville Human Nutrition Research Center is seeking a more complete definition of human requirements for essential nutrients. The Grand Forks Human Nutrition Center develops recommendations for nutrient intakes and is attempting to identify useful nutrient forms, particularly of minerals.

As Users of NNMS Data--Increasingly, the research-oriented agencies are also becoming major users of data from the monitoring system, and through that mechanism will contribute information applicable to the design and analysis of future population surveys. NIH over the past several years has become a major user of data from the NNMS, and has contributed funds to a variety of NNMS activities. The extensive analyses using data from the NHANES I Epidemiologic Followup Survey as part of NIH's biomedical and behavioral nutrition research and training program are illustrative of this use. For example, data from the NHANES Followup Survey are being analyzed to assess the effects of three different obesity measures calculated during NHANES I--relative weight, body mass index, and subscapular skinfolds, on cardiovascular disease among men and women at different ages. Results of this analysis may provide information useful in determining appropriate obesity measures in future surveys.

B. FOOD CONSUMPTION MEASUREMENTS

- **Nationwide Food Consumption Survey (NFCS)**: USDA's periodic NFCS, conducted by the Human Nutrition Information Service (HNIS), is the cornerstone of Federal efforts to monitor overall dietary status of the American people. National surveys were conducted in 1935-36, 1942, 1948, 1955, 1965-66, and 1977-78. The year-long NFCS-77 included both household food consumption (7-day recalls) and dietary intake (3-day: 1-day recall followed by 2-day records) components. Information was obtained from 15,000 sample households in 48 States. More than 30,000 household members of all ages provided information on all foods and beverages ingested at home and away from home.

In 1977-78, supplemental NFCS surveys were conducted for the first time in Alaska (urban) and Hawaii (about 1,200 households each), and in Puerto Rico (over 3,000 households). Also, supplemental surveys were conducted in the 48 coterminous States among the elderly population (5,000 households) and low-income households receiving or not receiving food stamps (over 4,200 households). In 1979-80, a second food consumption survey among low-income households (over 3,000) was conducted to determine shifts in food consumption and nutritional adequacy which may have been associated with higher price levels and changes in Food Stamp Program regulations.

Special purpose surveys have also been conducted. For example, in 1984, a Congressionally-mandated survey of household food consumption was conducted in Puerto Rico to determine change in usage and expenditures occurring since 1977, when the first Puerto Rican survey was undertaken.

NFCS-77 and supplemental surveys provide measures of levels and shifts over time in the food consumed and in the nutritional content and adequacy of consumption by households and individual household members. In both household and individual intake surveys, nutritional values have been derived for food energy and 14 nutrients, based on USDA food composition data files. Recommended Dietary Allowances, published by the Food and Nutrition Board, were used in the development of indicators of nutritional adequacy of diets of individuals by 22 sex and age groups and of household food consumption. Also, information was provided for foods reported on their source, type, and cost, and on socioeconomic and other factors associated with food selection, consumption patterns, and eating practices.

NFCS-87 began data collection in April 1987. Information similar to that collected in NFCS-77 is being obtained from 6,000 sample households from all incomes and from a supplemental sample of 3,600 low-income households (130 percent of poverty income or less), both in the 48 coterminous States. The survey includes a 7-day recall of household food usage and prices paid for purchased food and a 3-day reporting of food intakes of about 25,000 household members of all ages, as in the NFCS-77. The number of nutritional components (plus energy) for which information is derived, however, has increased from 14 in 1977-78 to 27 in 1987-88.

- **Continuing Survey of Food Intakes by Individuals (CSFII)**: USDA's CSFII conducted in 1985 (CSFII-85) was the first longitudinal food intake survey to be conducted on a national scale. Six 1-day reportings of food intakes were obtained over a year at approximately 2-month intervals. Information on the first day's intakes was obtained by personal interview in the respondent's residence. Subsequent contacts were by telephone, if possible, or by personal interview.

Three sample groups were interviewed in 1985: women 19-50 years and their children 1-5 years, all incomes; women 19-50 years and their children, low-income (130 percent of poverty income or lower); and men 19-50 years (1-day intakes only). Information was obtained from women and children in approximately 1,200 sample households each in the core (all income) and low-income groups, and from males in 750 households. CSFII-86 surveyed women and children in comparably-sized all income and low-income samples. Questionnaires and interviewing procedures used in CSFII-85 and CSFII-86 were adapted from those used in the food intake phase of NFCS-77. Nutritional data are being derived for 27 nutritional components and food energy.

In 1989 and each year following between the larger NFCS, CSFII will collect information on small national samples of households in the general and low-income populations. Dietary data will be obtained from all household members and will be reported by sex and age categories on a moving average basis. The purposes of this survey are to track food and nutrient consumption continuously and to provide a survey mechanism for special studies of groups believed to be at nutritional risk. For example, a special survey of low-income elderly persons is planned as part of CSFII-90.

- **Other HNIS Activities**: HNIS conducts research to identify reliable, efficient, and inexpensive methods for conducting large-scale food consumption surveys. The agency also develops systems for timely and accurate processing and presentation of data.

- **NHANES**: Information on dietary status is also provided through NHANES. In private interviews with trained dietitians information is collected on eating patterns, food consumption (24-hour dietary recalls), source of foods (home, restaurant, etc.), frequency of consumption of grouped foods, use of supplements, use of salt at the table, and frequency of eating away from home. Intakes of energy and 17 nutrients are determined for 28 age-sex groups. This dietary information was collected for NHANES I (1971-1974), NHANES II (1976-80), and the survey for Hispanic Americans, HHANES (1982-84). Dietary information will be expanded in NHANES III, and will include nutrient intake from vitamin and mineral supplements.

- **Total Diet Study**: FDA's yearly Total Diet Study monitors the levels of various organic and elemental contaminants and nutritional elements in the U.S. food supply and estimates the intakes of these substances in representative diets of specific age-sex groups. It was updated in 1982 to reflect the food consumption patterns indicated by NFCS-77 and NHANES II. Currently 234 foods are collected, prepared for consumption, and analyzed for contaminants and nutritional elements four times each year. Intakes of these substances are estimated for eight age-sex groups. The yearly data from this program allow for the identification of changes and trends in the levels of over 200 contaminants and 11 nutritional elements in the food supply.

- **Surveillance of Vitamin/Mineral Supplement Adverse Reactions**: The FDA's surveillance system for identifying adverse reactions to food products and additives has been expanded to include surveillance of adverse reactions to vitamin/mineral supplements. This system is designed to identify and evaluate complex adverse reaction complaints received by FDA district offices and from physicians.

C. FOOD COMPOSITION MEASUREMENTS

- **Nutrient Data Bank (NDB)**: The USDA Nutrient Data Bank is the major mechanism for collecting, evaluating, storing, and collating nutrient composition data for individual foods. The task is substantial, because there are some 10,000 to 15,000 food items in the U.S. food supply, and data are being acquired for 60 to 100 nutrients or other food components. Data are being collected and entered into the NDB on a continual basis, but the availability of data on some nutrients is limited by the lack of suitable methods. Sources of data include Federal Government laboratories, including USDA's Nutrient Composition Laboratory (NCL) and DHHS's FDA; university research and commercial laboratories under government sponsorship; and analyses of nutrients in foods conducted by industry, primarily in support of the nutrition labeling program. The development of the NDB is keyed to the process of revising Agriculture Handbook No. 8, Composition of Foods...Raw, Processed, Prepared, which is the standard reference table on nutrient composition. Of the 23 sections now planned, 16 have been completed and published.

Nutrient composition files used in support of NFCS-77 have been updated extensively for use in CSFII, NFCS-87, and HHANES. The number of nutritional components has been increased from 14 to 28 plus food energy. Revisions include introductions and deletions of food items to reflect current usage, inclusion of additional nutrients, and changes in existing nutrient composition measures resulting from changes in foods, usage patterns, and new information from the food laboratories. In 1985, foods reported in HHANES were incorporated into the USDA data base. In 1986, computer data tapes used in CSFII-85 and HHANES Mexican-American survey were released for public use through the National Technical Information Service of the U.S. Department of Commerce.

- **Nutrient Composition Laboratory (NCL)**: This laboratory is part of the USDA Beltsville Human Nutrition Research Center located in Beltsville, Maryland. It provides essential data on the nutrient content of foods as consumed in the United States by (1) analyzing the nutrient content of foods in tested, dependable assay techniques; (2) developing either new or improved methods for the analysis of nutrients of foods; (3) developing sound sampling techniques to ensure that representative samples are analyzed; and (4) conducting research on the effect of food processing procedures and transportation and marketing methods, as well as home, institution, and restaurant food preparation procedures on the nutrient composition of foods. NIH provides some financial support to this laboratory.

- **Total Diet Study**: As part of FDA's Total Diet Study--described under food consumption measurements--234 commonly consumed foods are collected, prepred for consumption and analyzed four times each year for over 200 contaminants and 11 nutrients.

- **Food Label and Package Survey (FLAPS)**: FDA conducts a biennial probability survey of retail packaged foods using commercial market research data bases (A.C. Nielsen Co.). The survey involves approximately 1,500 individual food brands representing about 44 percent of the packaged food supply in retail dollar terms. Data are interpreted on a share-of-market sales basis. The data are the basis for the FDA food ingredient and declared ingredient data banks, and are utilized for multiple special studies. By this tracking system, significant changes in the food industry's labeling practices are rapidly identifiable for most major food classes.

Since 1977, the FDA has maintained a surveillance program for nutrition labeling. A representative sample of the 55 percent of processed foods which bear nutrition labels is analyzed. Annually, approximately 300 foods are analyzed for an average of 8 nutrients, involving in excess of 2,000 individual analyses. This surveillance program permits FDA to track the evolution of nutrition labeling in the food supply, assure necessary levels of accuracy of label values, and identify segments of the industry which require encouragement. This activity also permits early identification by FDA of new fortification practices by industry. When combined with consumer studies, assessments of the value of nutrition labeling are possible.

- **Other FDA Activities**: FDA's methodological research focuses on improved methods to measure dietary fiber and nutrients in different foods, particularly trace minerals, fat-soluble vitamins, cholesterol derivatives, and trans-fatty acids. FDA is currently directing and participating in a collaborative effort to develop official methods for analysis of nutrients in infant formulas. This is necessary for insuring the quality and safety of infant formulas. FDA also is participating in a collaborative effort to improve methods for determining iron bioavailability.

D. DIETARY KNOWLEDGE AND ATTITUDE ASSESSMENT

- **Health and Diet Survey**: Periodically since 1978 FDA has conducted surveys based on national probability samples of households to measure public attitudes, knowledge, and practices about food and nutrition, particularly as they relate to such health problems as hypertension, hypercholesterolemia, coronary heart disease, and cancer. Each survey involves detailed telephone interviews of about 4,000 persons randomly designated from adults in a household.

Studies of this type permit rapid acquisition of knowledge about public attitudes and practices relative to foods and nutrition, as well as estimates of concerns and elements of confusion. Through this mechanism practices such as avoidance of certain food substances through use of food labels are clearly identified (e.g., avoidance of fats, sugars, etc.), as are impacts of health and nutrition information programs. In addition, assessments are made of the influence of nutrition misinformation and the public's ability to comprehend food label information. Since 1982, these surveys have been cosponsored by NIH.

- **Survey of Infant Feeding Practices**: The FDA will conduct a prospective survey of infant feeding practices among pregnant women in 1988 or 1989. The survey will include prenatal interviews and monthly contacts with the mother throughout the infant's first year of life in order to determine what aspects of pre- and post-natal care, as well as demographics, health care visits, and other factors influence feeding practices.

- **Survey of Weight-Loss Practices**: A national probability survey of adults will be undertaken by FDA in 1987 or 1988 to determine dieting and weight-loss practices. The breadth and extent of weight control practices will be examined demographically and also in relation to reasons for dieting, self-reports of health status, physician involvement, sources of information, attitudes about food and dieting, and other situational factors influencing weight control behavior. NIH contributed to the development of this survey.

- **NCHS Surveys**: NHANES provides a limited amount of information in this area through questions about breast-feeding practices. The National Maternal and Infant Health Survey should also contribute information about feeding practices. The National Health Interview Survey special topic surveys provide information about diet-related behaviors.

- **NFCS and CSFII**: Previous NFCS and CSFII surveys have assessed knowledge and attitude only insofar as behavior in terms of food consumption, food purchases, and eating practices can be used as proxy measures for dietary knowledge and attitude. Certain questions in these surveys, such as those on self-evaluation of food sufficiency, avoidance of certain foods or types of foods, and reasons for not participating in the Food Stamp Program were reflections of attitudes. HNIS, FSIS, and FDA are planning a follow-up Consumer Perceptions Survey of CSFII respondents in 1989 and beyond. From these data, knowledge and attitudes about selected diet and health issues can then be associated with food consumption behavior, also measured in CSFII.

- **NIH**: The National Institutes of Health, particularly NCI, NHLBI, and NIDDK, provide information about dietary knowledge and practices directed toward specific diseases and chronic conditions. Several of the larger efforts include: the physicians and public cholesterol awareness surveys conducted in 1986 by NHLBI and the survey of nurses' and dietitians' knowledge and attitudes toward cardiovascular disease risk factors planned for 1988.

The latter is unique because it will provide national data on nurses and dietitians, who play a critical role in prevention and management of cardiovascular disease. Registered nurses, occupational health nurses, and registered dietitians involved in patient care will be surveyed by mail to determine their behavior, knowledge, beliefs, and attitudes related to the three major cardiovascular disease risk factors: high blood pressure, elevated blood cholesterol, and cigarette smoking. There will be an initial mailing in the fall of 1988 and two successive mailings provided to nonrespondents. This study will provide information to help plan the professional education efforts of the National High Blood Pressure Education Program, the National Cholesterol Education Program, and the NHLBI Smoking Education Program. The survey will also provide baseline data for the evaluation of these programs.

E. FOOD SUPPLY DETERMINATIONS

- **Supply Data**: USDA'S Economic Research Service (ERS) estimates annually the quantities of various foods that "disappear" into civilian consumption. These estimates are derived from statistics on the production or marketing of farm products, foreign trade, and stock changes; the flow of foods through warehouse and/or retail markets; and ad hoc studies of special products. They are expressed as national averages per capita and show levels of food supplies each year since 1909 in food quantities and price-weighed indices.

HNIS estimates the quantities of food energy (calories), 23 nutrients, and cholesterol provided by the per capita food supply each year. These data can be used to alert the Department if food supplies, when efficiently and equitably distributed, are not sufficient to provide recommended amounts of nutrients for the population. Also they are useful for showing trends since 1909 in food and nutrient consumption relative to statistics on nutritional health and incidence of disease. They also show trends in the relative importance of foods as providers of nutrients in the food supply.

- **Demand Studies**: A variety of ERS activities contribute information about the nature of the national food supply and patterns of consumption. Of particular importance are economic and marketing information which permit evaluation of aggregate shifts in food consumption and price-consumption relationships. Efforts of this kind are important in assessing changing food consumption patterns and may presage nutritional problems. HNIS and ERS use the NFCS data to predict the demands for foods by households of given characteristics (income, race, sex-age composition, food assistance program participation, etc.).

Appendix 1 Table: Nutrition Monitoring and Related Activities

CATEGORY	ACTIVITY	DEPARTMENT*	AGENCY*	POPULATION	TIMING
HEALTH AND NUTRITIONAL STATUS MEASUREMENTS	National Health and Nutrition Examination Surveys	DHHS	NCHS	U.S. population, Special Groups	
	NHANES I			1-74 yrs	1971-1974
	NHANES II			6 mo-74 yr.	1976-1980
	Hispanic HANES			6 mo-74 yr	1982-1984
	NHANES III			2 mo +	1988-1994
	National Health Interview Survey	DHHS	NCHS	U.S.	Annual
	NHIS Special Topics	DHHS	NCHS	U.S.	Selected Topics
	NHANES I Epidemiologic Followup	DHHS	NCHS	NHANES I Elderly	1982-1984, 1987, 1986
	National Survey of Family Growth	DHHS	NCHS	Women 15-44	1976, 1983, 1987
	National Maternal & Infant Health Survey	DHHS	NCHS		Planned 1988
	National Mortality Survey	DHHS	NCHS		Annual 1961-1968, 1986
	Vital Statistics	DHHS	NCHS	U.S., States, Counties, Local areas	Annual
	Coordinated State Surveillance System	DHHS	CDC	Pregnant women, Children in	Continuous
	Behavioral Risk Factor Surveillance System	DHHS	CDC	Adults	Continuous
	Nutrition Research in Support of Nutrition Monitoring**	DHHS USDA	NIH ARS CDC FDA	Varies	Ongoing

Continued ...

Appendix 1 Table: Nutrition Monitoring and Related Activities, page 2 ...

CATEGORY	ACTIVITY	DEPARTMENT*	AGENCY*	POPULATION	TIMING
FOOD CONSUMPTION MEASUREMENTS	Nationwide Food Consumption Survey	USDA	HNIS	U.S., Low-income Sample	every 10 years current 1987-88
	Continuing Survey of Food Intakes By Individuals (CSFII)	USDA	HNIS		
	1985 and 1986			Women 19-50, Their Children, Men, Low-income Sample	Annual
	1989 and beyond			U.S. population, Low-income Sample, Other	Annual (planned)
	NHANES	DHHS	NCHS	U.S. population	See Prior Page
	Total Diet Study	DHHS	FDA	Specific Age-Sex Groups	Annual
	Vitamin/Mineral Supplement Adverse Reactions	DHHS	FDA	U.S.	Continuous
FOOD COMPOSITION MEASUREMENTS	Nutrient Data Bank	USDA	HNIS		Continuous
	Nutrient Composition Laboratory	USDA	ARS		Continuous
	Food Labeling and Package Survey	DHHS	FDA		Annual and biennial parts
	Total Diet Study	DHHS	FDA		Annual
	Fiber, Carotenoid and Vitamin A comp. Studies; Taurine and Biotin Comp. Studies	DHHS	NIH/NCI NIH/NIDDK		Ongoing Ongoing

Continued ...

Appendix 1 Table: Nutrition Monitoring and Related Activities, page 3 ...

CATEGORY	ACTIVITY	DEPARTMENT*	AGENCY*	POPULATION	TIMING
DIETARY KNOWLEDGE AND ATTITUDE ASSESSMENT	Health & Diet Survey	DHHS	FDA	U.S. Adults	18-22 Mo. Intervals
	Survey of Infant Feeding Practices	DHHS	FDA	Pregnant Women	1988 or 89
	Survey of Weight-Loss Practices	DHHS	FDA NIH/ NHLBI	U.S. Adults	1987 or 88
	Cholesterol Awareness Survey	DHHS	NIH/ NHLBI +FDA	Physicians Adults	1986
	Nursing and Dietitian Survey	DHHS	NIH/ NHLBI	Nurses, Dietitians	1986, 1987
	NHIS Special Topics	DHHS	NCHS	U.S. Adults	
	Health Promotion/ Disease Prevention				1985
	Vit/Min Supplement/				1986
	Cancer Control		+NIH/NCI		1987
	CSFII Follow-up (Consumer Perceptions Survey)	USDA/ DHHS	HNIS FSIS FDA	U.S. Population	Planned 1989-1996
	Physician Knowledge Survey on Hypertension	DHHS	NIH/ NHLBI	Physicians	1978-1988
	Cancer Prevention Awareness Program	DHHS	NIH/ NCI	U.S. Adults	1984 + Ongoing
FOOD SUPPLY DETERMINATIONS	Supply Data	USDA	ERS HNIS	U.S. Population	Annual
	Demand Studies	USDA	ERS	U.S. Population	Continuous

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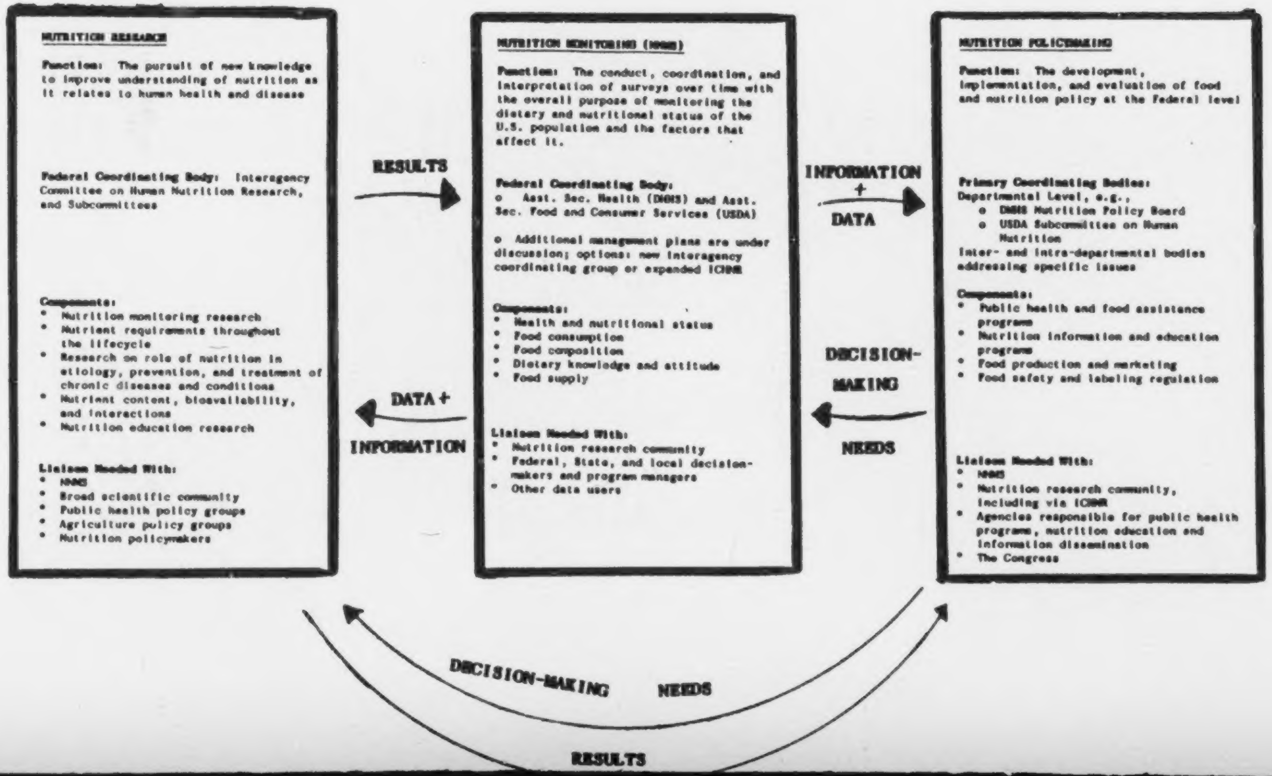
* ARS = Agricultural Research Service, CDC = Centers for Disease Control, DHHS = Department of Health and Human Services, ERS = Economic Research Service, FDA = Food and Drug Administration, FSIS = Food Safety and Inspection Service, HNIS = Human Nutrition Information Service, NCHS = National Center for Health Statistics, NCI = National Cancer Institute, NHIS = National Health Interview Survey, NHLBI = National Heart, Lung, and Blood Institute, NIDDK = National Institute of Diabetes and Digestive and Kidney Diseases, NIH = National Institutes of Health, USDA = U.S. Department of Agriculture

**Includes research on nutritional status assessment and requirements throughout the life cycle. The nutritional status research focuses on (1) indices of nutritional status, (2) micromethods to measure nutrient concentrations in various tissues and plasma, and (3) methods that improve accuracy of dietary intake data.

APPENDIX 2

NUTRITION RESEARCH, MONITORING, AND POLICYMAKING: FUNCTIONS, COMPONENTS, AND RELATIONSHIPS



NUTRITION RESEARCH

Function: The pursuit of new knowledge to improve understanding of nutrition as it relates to human health and disease

Federal Coordinating Body: Interagency Committee on Human Nutrition Research, and Subcommittees

Components:
- Nutrition monitoring research
- Nutrient requirements throughout the lifecycle
- Research on role of nutrition in etiology, prevention, and treatment of chronic diseases and conditions
- Nutrient content, bioavailability, and interactions
- Nutrition education research

Liaison Needed With:
- NNMS
- Broad scientific community
- Public health policy groups
- Agriculture pulicy groups
- Nutrition policymakers

NUTRITION MONITORING (NNMS)

Function: The conduct, coordination, and interpretation of surveys over time with the overall purpose of monitoring the dietary and nutritional status of the U.S. population and the factors that affect it.

Federal Coordinating Body:

o Asst. Sec. Health (DHHS) and Asst. Sec. Food and Consumer Services (USDA)

o Additional management plans are under discussion; options: new interagency coordinating group or expanded ICHNR

Components:
- Health and nutritional status
- Food consumption
- Food composition
- Dietary knowledge and attitude
- Food supply

Liaison Needed With:
- Nutrition research community
- Federal, State, and local decision-makers and program managers
- Other data users

NUTRITION POLICYMAKING

Function: The development, implementation, and evaluation of food and nutrition policy at the Federal level

Primary Coordinating Bodies:
Departmental Level, e.g.,
  o DHHS Nutrition Policy Board
  o USDA Subcommittee on Human Nutrition
Inter- and intra-departmental bodies addressing specific issues

Components:
- Public health and food assistance programs
- Nutrition information and education programs
- Food production and marketing
- Food safety and labeling regulation

Liaison Needed With:
- NNMS
- Nutrition research community, including via ICHNR
- Agencies responsible for public health programs, nutrition education and information dissemination
- The Congress

Office of Scientific Public Affairs
and Nutrition Division
INSTITUTE OF FOOD TECHNOLOGISTS

MARCH 1988

RESEARCH REQUIRED TO IMPROVE THE VALIDITY AND UTILITY OF NUTRITION MONITORING ACTIVITIES

Report of the National Food/Nutrition Science Policy Workshop

(Held September 13-15, 1987)
(in Washington, D.C.)

This workshop was sponsored and convened by the IFT Office of Scientific Public Affairs, with substantive direction from the IFT Nutrition Division.

OTHER PARTICIPATING SOCIETIES:

American Association of Cereal Chemists
American College of Nutrition
American Dietetic Association
American Home Economics Association
American Institute of Nutrition
American Public Health Association
American Society for Clinical Nutrition
American School Food Service Association
Council for Agricultural Science and Technology
Society for Nutrition Education

RECOMMENDATIONS

I. MEASURES OF FOOD CONSUMPTION AND DIET PATTERNS

There is a need for alternative approaches and innovative research for the collection and the interpretation of food consumption, and dietary status data. The intrinsic errors and insensitivity of currently available methods are limiting factors in the correlation with health status data that might otherwise reveal important diet-health relationships.

Research is required to:

A. Improve methodology for measuring food intake and dietary status.

B. Develop appropriate standards for interpretation of data.

C. Identify and monitor special, at risk population subgroups.

D. Develop new methodologies for assessment and monitoring of dietary status.

E. Identify core data required to link different surveys.

F. Improve evaluation, reporting and exchanging of dietary monitoring findings and procedures.

II. CLINICAL MEASURES OF NUTRITIONAL STATUS

It is of utmost importance that methods chosen to assess the nutritional status of an individual, or groups of individuals (populations), are methods in which we can place a high degree of confidence. Research is needed to:

A. Assure that methods chosen for nutritional status assessment give reliable and useful information.

B. Identify measurements that are central to, or at the core of, the assessment of nutritional status.

C. Develop new and improved methodologies.

D. Study the ways to assess nutritional status of special populations.

E. Ascertain the relationship between food intake (dietary behavior and food consumption) and chronic diseases.

F. Study the genetic determinants of nutritional status.

ABSTRACT

Research is the foundation of an effective nutrition monitoring system. Research is required to improve existing methods and develop new techniques to assess the complete system (food, economics, health, education). The long range intent of a nutrition monitoring system should be to provide data to encourage public policy decisions that promote optimal health, ensure a safe food supply, prevent nutrition-related problems, and enhance the quality of life.

INTRODUCTION

Since the early 1970's, the U.S. federal government has been conducting nutrition monitoring of the U.S. population. Nutrition monitoring is defined as "an on-going description of nutrition conditions in a population—with particular attention to subgroups defined in socioeconomic terms—for purposes of planning, analyzing effects of policies and programs, and predicting future trends."* Monitoring is conducted principally by the U.S. Department of Health and Human Services. Corollary to the monitoring are food consumption surveys undertaken by the U.S. Department of Agriculture. By Congressional mandate, the monitoring program is coordinated by a joint committee representing both USDA and USDHHS.

Recently, needs to direct research toward the improvement of the nutrition monitoring program have been articulated by members of the U.S. Congress, in an operational plan by the two responsible federal agencies, and many members of the scientific community. The federal agencies submitted their "Operational Plan for the National Nutrition Monitoring System" to the Congress in August, 1987, and made it available to the scientific community in November, 1987. In January, 1987, representatives of 14 professional nutrition societies met to plan a workshop at which research needed to improve nutrition monitoring techniques would be specified by the scientific community. That workshop was held in Washington, D.C. on September 13-15, 1987, attended by 25 nutritional scientists from complementary disciplines. Sixteen representatives of the two responsible federal agencies also took part, as did 10 other observers representing interested societies, various Congressional offices, and involved federal agencies.

The participants deliberated research needs in two broad topic areas, nutrient status and dietary status, corresponding generally to the two major monitoring and survey thrusts. (Participants and other attendees are listed in Appendix A.) (In a few instances, redundancy exists in recommendations in the two topic areas, and thereby reinforces a need for better methodology.)

This document reports the outcomes of those deliberations. In some cases, this report specifies research also identified as needed in the federal agencies' "Operational Plan for the National Nutrition Monitoring System."

The workshop attempted to fully assess the effectiveness of the overall national nutrition monitoring system, based on the participants' scientific expertise. From a variety of health professional viewpoints—as clinicians, survey methodologists, nutritional biochemists, and food-nutrient scientists and data users—they brought to bear their awareness of the scientific limitations of monitoring techniques and evaluation of collected data. This report identifies, in the opinion of the participants, the most critical research needs to improve nutrition monitoring.

As such, it represents a starting point. Most of the participants believe there is general agreement among knowledgeable experts that the areas identified in this report are problems that represent major impediments to effective monitoring, and require solution before the state of the art can progress.

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* "Operational Plan for the National Nutrition Monitoring System," U.S. Department of Health and Human Services, Public Health Service; and U.S. Department of Agriculture, Food and Consumer Services; Washington, D.C., August 1987.

The professional scientific societies that planned this workshop and contributed to this report believe that the utility and value of the nutrition monitoring system can and must be improved. The extent to which these improvements are made correlates with the amount and timeliness of implementation of the research recommended herein.

SUMMARY

Information on dietary habits is essential in the formulation of public policies that promote and protect good health.

The current system of gathering and recording nutritional information is limited and must be revised and updated.

With the current system, it is difficult to retrieve information. Data from various surveys have been reported in different forms. Standards for evaluating diet and health information often vary. It is difficult to obtain data concerning certain foods, nutrients and other dietary components consumed by the population. These deficiencies have hampered utility of information available to government agencies, nutrition and health professionals, the food-consuming public and the food industry.

Changes in the monitoring system could dramatically improve the accuracy and timeliness of diet and health information. For example, accurate information on the dietary habits of the elderly and others at risk for nutritional problems would help formulate better diets. New survey techniques could reduce the costs of gathering information. Improved methodologies could make information more easily available to policymakers and researchers around the country. And accurate, timely information could identify nutrition-related public health problems and trends for development of appropriate public wellness policies.

Similarly, the clinical techniques used to assess nutritional health are in need of improvement.

Significant improvement in assessment of diet and health problems requires emphasis on research. New methodologies and innovative technology can improve the quality and accessibility of nutrition and health information.

An accurate, up-to-date system of monitoring food consumption and health parameters can then provide information essential in developing sound public policies.

Good nutrition is essential for good health. Identifying potential nutrition problems can serve as an "early warning system" for Americans and help stem the rapid escalation in health care costs.

The benefits of research to improve the system of nutrition and health monitoring far outweigh the costs.

I. MEASURES OF FOOD CONSUMPTION AND DIET PATTERNS

A. Improve methodology for measuring food intake and dietary status.

Accurate measurements of food intake and dietary status require (1) valid data collection methods; (2) methods to assure the reliability of reported dietary intake; and (3) current information about essential nutrients and non-nutrient components that are of interest.

1) Validity

The validity of new methods used to assess dietary intake must determine the extent to which survey data measure that which is intended to be measured, i.e. correctly approximates "true" or "usual" food and nutrient consumption. Absolute validation is problematic because true "usual" intake cannot be determined.

Critical research issues concerning validity include:

1. Standard procedures to determine and apply accepted validity measures to new research instruments.

2. Development of "relative" or "concurrent" studies to validate new dietary intake methods. For example, data from new studies could be validated against data from:

   a. previous surveys;

   b. other collection methods, and assuming weighed intakes as being the most precise;

   c. proxy individuals;

   d. associated biochemical studies; and

   e. multiple measures, such as UPC codes.

3. New methods or procedures to assess the validity of dietary survey data must be developed and tested. For example, computerized dietary data collection systems with limited numbers of foods vis-a-vis standardized collection and coding mechanisms must be validated.

2) Reliability

Reliability is concerned with whether survey responses are consistent, reproducible or repeatable. With a reliable technique, measurement will not vary significantly by time, places and occasions. Because it is difficult to distinguish between actual variation in dietary intake and systematic error, research must a) determine factors affecting the reliabiility of responses, and b) identify and quantify other sources of error.

Critical research concerning data reliability includes:

1. Maintaining data reliability when linking data from various national surveys and/or small-scale regional surveys.

2. Assessing the reliability of data when traditional methods are adapted to survey hard-to-reach, deprived or incapacitated populations.

3. Ascertaining whether non-response affects data reliability and, if so, whether methods, such as incentives, can minimize non-response rates without reducing reliability.

4. Determining whether using a "core" set of dietary indicator questions supplemented with queries appropriate for sub- or split population-groups (such as urban vs. rural, adult vs. children, etc.) affects reliability (e.g. do smaller sample sizes affect reliability of measures of "usual" intake) for these population subgroups?

5. Determining whether intra-interviewer and inter-interviewer variation affect data reliability and if variability can be minimized.

6. Determining the reliability of reported food intake when standard meal menus, such as utilized in elderly food delivery programs and school lunches, are used to supplement missing survey data.

7. Assessing the reliability of unobtrusive measures (e.g. grocery slips, magnetic cards, computer kiosk programs, TV monitoring) to ascertain the intake of foods commonly consumed.

8. Develop methods to reliably record nutrient intakes from vitamin and mineral supplements.

3) Nutrient and non-nutrient components: Food Composition Data

Food composition data are essential in determining the nutrient content of food disappearance, household food consumption, and individual dietary intake. Each of these measures of food consumption must be underpinned by composition data on foods, nutrient, non-nutrients, processing factors, and other information essential to monitor dietary status, and to relate food consumption patterns to nutrition and health.

Research needs for improvements in data base systems includes:

1. Identification of critically needed analyses of food components such as fiber, caloric and non-caloric sweeteners, trace vitamins and minerals.

2. Development of defined, preferred criteria for accurate, precise, rapid and cost-effective methods to analyze various nutrients and food components in different foods.

3. Development of sound sampling procedures, standards, and reference materials.

4. Development of ways to rapidly consolidate data for use in food consumption surveys and other areas.

B. Research to develop appropriate standards for interpretation of data.

1) Food and Nutrient Consumption

Food consumption data are evaluated with respect to accepted standards of optimum nutrient needs. In the United States, Recommended Dietary Allowances (RDA's) or "Estimated Safe and Adequate Daily Dietary Intakes" have been developed for population groups. In addition, food guides such as the Basic Four Food Groups, are used. These and other dietary standards are needed to evaluate different consumption data.

Research is required to:

1. Designate appropriate standards (e.g. RDA, WHO, Basic Four) for evaluating adequacy of consumption, and define "margins of safety" for each standard.

2. Develop standards, interpretive criteria, and appropriate uses of in-depth analysis in order to identify risk levels for nutrient and food components consumed. Examples include: Index of Nutritional Quality (INQ), Calories for Nutrient (CFN), Nutrient Adequacy Ratios (NAR), probability distributions, excess and deficiency levels, boundaries of acceptability, nutrient ratios and proxy variables.

3. Determine more precise reference standards for children, the elderly and other groups.

4. Reexamine dietary standards and food and nutrient intake of subgroups chronically "at-risk" of deficiency, and determine whether current standards should be modified for these groups, e.g. vitamin A for Spanish-Americans, iron for women.

5. Identify information gaps, and methodologies needed to establish dietary requirements and standards for nutritive and non-nutritive components where data are lacking (e.g. added caloric sweeteners, fiber, fatty acids, vitamin B_6, folacin, magnesium, and zinc).

2) Diet and Health Relationships

A nutrition monitoring system also helps identify threats to health due to inadequate, excessive, or imbalanced intake or intake of harmful substances. Assessment of diet and health relationships requires baseline data on social, economic and other factors in addition to nutrition. Currently there are few indicators or standards for addressing diet and health risk other than the "Dietary Guidelines", similar qualitative, and a few quantitative recommendations. More definitive standards are needed to identify how food intake affects performance, health and survival (outcomes).

Critical research issues concerning diet/health standards are to:

1. Determine dietary patterns, rather than single nutrient or non-nutrient components, that may act as dietary indicators or standards of health.

2. Define relationships between diseases (e.g. obesity or hypertension), and food/nutrient intake, both of which have continuous population distributions, in order to identify "unusual" from "common" diets associated with disease distribution patterns for different age and social groups.

3. Identify reference populations to compare food and nutrient related indicators in healthy versus non-healthy populations.

C. Research directed toward population subgroups

Nutrition monitoring objectives include description of dietary status of the population, with particular reference to subgroups identified as being "at-risk". Baseline data are needed to determine the most appropriate subgroups to monitor. In addition, special studies of population segments whose diet and health indicators appear to be abnormal, can help establish benchmarks of nutritional risk.

Essential research needs for subpopulations include:

1. Develop and utilize new technologies for groups difficult to monitor, e.g. those in institutions (college dorms, boarding houses, military bases) or who are difficult to survey due to illness, memory loss, cognitive or sensory impairment or other reasons. Computer assisted assessment, unobtrusive observation, proxy or cuing variables, surrogate respondents, and alternative descriptors such as brand names are possible monitoring techniques.

2. Determine whether certain settings or locations (e.g., schools, senior citizen centers) bias or enhance data collection results by encouraging or inhibiting reporting of certain food items, such as alcohol or candy.

D. **Research to develop new methodologies for assessment and monitoring of dietary status.**

Many measures of diet and health status are costly, time consuming, inadequate and ambiguous. Research to improve methods and techniques can enhance the quality, timeliness and usefulness of the data.

Critical research in new methodologies include:

1. Develop methods to detect and predict dietary and health trends via ongoing sampling and retrospective analysis.

2. Develop methods to routinely identify and classify new groups at risk. Potential methods include national or regional surveys to acquire data on biological, physical, socioeconomic and cultural situations associated with nutritional inadequacies.

3. Develop methods to provide information on relationships among "usual" and "extreme" food, nutrient and non-nutrient intakes, nutritional status, and disease states, useful for defining risk levels and appropriate preventative measures.

4. Develop processes to enable use of trend data to predict evolution of nutritional problems, and to formulate policies and commit resources for appropriate intervention.

5. Assess the diet and health concerns of the population and incorporate these concerns into survey questions.

E. **Research to identify core data required to link different surveys.**

Adequate nutrition monitoring can detect nutritional problems and unfavorable changes in dietary habits and health status early enough to plan corrective measures. A nutrition monitoring system should function at national, regional and local levels. Continuous surveillance should be based on selected indicators, i.e., a set of "core" data, and standardized procedures.

Critical research areas concerning establishing "core" data:

1. Identify the minimum "core" indicator variables that would permit linkage and comparison of local, regional and national dietary studies and surveys.

2. Identify as part of the "core" data, dietary indicators, (including specific vitamin and mineral supplements) which warrant priority status. Continued surveillance of these indicators will monitor trend changes and identify current or future nutritional problems. Non-nutritional food components may affect the "core" variables and must also be considered.

3. Use of non-nutritional "core" data, particularly demographic information, to monitor appropriate population subgroups.

4. Ascertain frequency of surveys of "core" data required to assess changes and trends.

5. Standardize sampling, collection, and measurement methods to be used with all surveys in the monitoring system.

6. Develop mechanisms to coordinate interchange of "core" data and standard collection procedures, and encourage feedback and discourse among national and state monitoring systems.

7. Develop valid methods for using small (state or regional) samples and integrating these data into the nutritional monitoring system.

8. Develop methods to store and retrieve food consumption and food composition data of "core" variables for retrospective studies of the "core" data monitoring set and to identify need for new or additional indicator variables.

F. Research to improve evaluation reporting and exchange of dietary monitoring findings and procedures.

Research objectives:

1. Establish mechanisms to report and exchange results in standardized formats.

2. Improve methods to evaluate the monitoring system, including planning, sampling, data collection, costs and sensitivity of indicators.

3. Develop methods to ensure that the system expands by meeting state and local needs for procedural guidance, cost containment and exchange of available, relevant data from all sources.

4. Implement external peer review of research, monitoring design, data collection, timeliness of reporting, and ensure that the system meets the needs of researchers and the public.

Finally, we recommend development of a coalition of scientific societies to enhance public and professional understanding of the importance of nutrition monitoring research, and the economic significance of monitoring studies to public health. A scientific coalition should provide guidance and balanced viewpoints to policy makers and educate legislators about the benefits and limitations of a nutrition monitoring system.

II. CLINICAL MEASURES OF NUTRITIONAL STATUS

A. Research to assure that methods chosen for nutritional status assessment give reliable and useful information.

Research is required to identify the conditions necessary for a method to give repeatable (reliable) results. This includes identification of:

1. factors that interfere with measurements,
2. aspects of the method that are most variable,
3. the susceptibility of the method to changes when different laboratories and different investigators and technicians are involved.

The validity of a chosen method is also important. Research is necessary to establish that a given method truly measures the parameter that it is intended to measure, i.e. that it is a valid measure. For example, if we hope to measure the total calcium in serum, it is necessary to establish, through comparative research, that the chosen method:

1. measures calcium accurately
2. does not include measurement of interfering substances other than calcium,
3. detects all the calcium, not just one form of it.

The research to assure reliability and validity of a method is essential to the overall quality assurance for the methods chosen.

Beyond quality assurance, it is important to identify control standards and procedures that will insure that throughout the time that a method is used the method continues to provide the quality results of which it is capable. Quality control requires that the necessary control components are identified, such as appropriate standards and specific procedures and that the controls are monitored throughout the time that the method is being used. Research is necessary to identify the most appropriate controls. Peer reviewers, with the relevant research experience, are necessary to guide the establishment of and the interpretation of the data obtained in quality control monitoring. Usually peer reviewers must include experts who are not directly involved in doing the particular research under consideration. This approach guards against a conflict of interests, but also is to involve the necessary number of the most qualified individuals available.

This is an area of research that has received attention in the past but requires even more attention and resources for the future if quality assurance and quality control are to be adequately considered in assessments of nutritional status.

B. **Research to identify measurements that are central to, or at the core of, the assessment of nutritional status.**

There are at least two reasons for identifying sets of measures that are the core of the assessment of nutritional status of individuals or groups. First, different sets of measures are appropriate to different group and different circumstances, but research experience with each measurement is necessary to establish the extent of its usefulness in measuring nutritional status. When the relative importance of a measurement is established, its centrality to the task can be identified and, on this basis, advice can be given to new groups, such as state or local groups, that may be interested in starting their own nutritional status assessment within certain populations.

A second reason for doing research to establish the relative usefulness of a measurement is to aid in establishing the degree to which it is cost-effective. Resources for assessments of nutritional status are always limited and good management requires that the cost-effectiveness be considered for each measurement chosen to be part of the overall assessment.

Results of research establishing the usefulness of measurements and their cost-effectiveness needs to be evaluated by investigators with appropriate expertise and the ability to credibly interpret the results and formulate recommendations to those who are less knowledgeable but who must make decisions related to nutritional status assessment.

C. **Research to identify new and improved measures of nutritional status.**

1. Body Composition

Research is needed to accurately and rapidly better determine body composition as it is influenced by nutritional status. Specific aspects of body composition of interest include:

A. lean body mass

B. body fat

C. bone density.

An example of a new rapid and sensitive method for body composition determination is the use of ultrasound for body fat determination.

2. Tissue Levels of Nutrients

New and improved methods are needed to ascertain tissue levels of minerals and vitamins in both static and dynamic states. It is important to identify measurements and develop methods that are quantitatively indicative of tissue pools. Some examples of new methodologies that need research are:

A. stable isotopes

B. in-situ NMR

C. MT measurements for zinc.

3. Functional Responses

New and improved methods need to be developed to better assess and relate functional responses to nutritional status. Those functional responses most likely to reveal an influence of nutritional status include:

A. immune response

B. physical (work) performance

C. behavior

D. organ system (eg. kidney function)

E. sight and hearing.

4. Non-nutrients

A new aspect of nutritional status assessment is the effect of non-nutritive dietary components. Examples include non-nutritive sweeteners and dietary fiber. New methods need to be developed to assess the effect of these factors.

Characteristics that should be of priority in developing and improving methodology are:

A. non-invasiveness

B. microanalytical capability

C. rapidity

D. cost-effectiveness

It is essential that it be understood how new and improved methods relate to nutritional and health status. Another set of parameters needing research is the specific cut-off points (high and low) for both blood and other analyses. The correlation of risk with specific blood levels and other parameters using both low and high cut-off points is important. The establishment of "safe ranges" for nutrients is similarly important.

D. **Research to study ways to assess the nutritional status of special populations.**

Specific sub-population groups are currently not being assessed in national surveys. Research needs to be directed at the mechanics of including these groups and effectively evaluating their status, since they comprise an increasingly high percentage of our population. Examples of these groups include the following:

1. the elderly
2. the institutionalized
3. the homeless
4. migrants
5. drug users
6. immigrants.

The elderly (>75 years) have not been included in previous national surveys. New methods need to be devised to insure participation of this age group and to accurately assess their nutritional status. Specific age-related standards need to be developed for this age group. For example, standards for iron-status parameters would be different from those currently used for younger adults. Methodology for sampling this subpopulation group is another area of needed research. Development of new methods for new parameters with special relevance in the elderly is a critical research area. Improvement of established methods to facilitate their use in the elderly needs research.

A large percentage of the elderly live in a small number of states in a wide range of housing situations, ranging from the homeless to the institutionalized. Individuals who are homeless, including migrants, immigrants, etc., have not been included in previous surveys since they do not have home addresses. New methods need to be devised to sample these individuals and to modify survey techniques to account for those environmental influences that may affect nutritional status.

The development of research instruments to assess the quality of life is of importance to these specific subpopulation groups. Different instruments need to be devised for use with specific age and ethnic groups.

E. Research to ascertain the relationship between food intake (dietary behavior and food consumption) and chronic diseases.

Research needs include defining the link between food intake and the major diet-related chronic diseases (i.e. obesity, CHD, cancer, diabetes, etc). Measures of disease-related responses (to food intake) and disease-specific risk factors are required. Specifically, more accurate estimates of an individuals' usual level of a nutrient or risk factor are needed. This requires replicate sampling and accounting for factors that effect values (i.e. season, time of day, fasting state). In addition, inter-and intra-variability of the measurements must be known.

A cross-sectional investigation of the nutrient-disease related link provides important correlation/association information. Additional studies are required to define the role of diet (or a nutrient or diet component) on the development of specific chronic diseases. Both intervention and longitudinal (and semi-longitudinal) studies are necessary to establish a causal link between diet (and specific inherent dietary factors) and various chronic diseases.

In examining the relationship between diet and chronic diseases via cross-sectional, longitudinal, semi-longitudinal, and intervention studies, biochemical data, and additional end-point data should be collected. Morbidity and mortality data, as well as information on the quality of life can clarify the role of diet (and dietary constituents) in the development of chronic diseases.

F. Research to study the genetic determinants of nutritional status.

Many commonly inherited diseases in our society are influenced by nutrition. Hyperlipidemia, diabetes, osteoporosis, cancer and obesity have a strong genetic component, though diet is crucial in theri prevention, progression and treatment. With advances in molecular biology, we are able to identify the genes responsible for some (a limited number) genetic disorders. Technology exists however to identify virtually all genes that manifest various traits (and diseases). Research is needed to identify the genetic markers of nutrition-related diseases. With this new and valuable information, nutritionists will be able to screen individuals for various genetic markers and provide individual diet counseling, when indicated. Specifically, if an individual is genetically predisposed to obesity (as determined by a specific genetic marker) intensive intervention efforts could be directed toward obesity prevention. The broad application of this future technique holds promise in preventing, delaying the onset and slowing the progression of many common genetic diseases that are influenced by nutrition.

Intervention studies are required to define the mechanism by which diet modifies a response. With molecular biology techniques, we will be able to study gene expression responses to diet modification. Ultimately, with diet alone or in combination with other treatments, we may be able to "turn-on" and "turn-off" genes to prevent disease.

# # #

APPENDIX A

NUTRITION POLICY WORKSHOP ASSIGNMENTS

Chairman: Dr. Paul Lachance, IFT

Plenary Session Moderator Dr. Richard Allison, AIN

Breakout Group A.

CLINICAL DATA/NUTRIENT STATUS

Delegates:

Chair: Dr. Patricia Swan

2. Dr. Penny Cris-Etherton,	ADA
3. Dr. Lynn Bailey,	IFT
4. Dr. Susan Pilch,	AIN
5. Dr. SueAnn Anderson,	AIN
6. Dr. Stephen Schiaffino,	ASCN
7. Ms. Jerianne Heimendinger,	APHA
8. Ms. Ellen Thompson,	APHA
9. Ms. Janet Brantly R.D.,	ASFSA
10. Dr. Martha Taylor,	SNE
11. Catherine Walsh,	SNE

Invited Observers:

Dr. Gerald Combs	USDA/ARS
Dr. Elizabeth Yetley	DHHS/FDA
Dr. Christopher Sempos	DHHS/NCHS
Dr. John Vanderveen	DHHS/FDA

Breakout Group B.

FOOD CONSUMPTION/DIETARY STATUS

Delegates:

Chair: Dr. Helen Guthrie

2. Dr. Elizabeth Prather,	ACN
3. Dr. Carol Windham,	ADA
4. Dr. Helen Smiciklas-Wright,	AIN
5. Dr. Mary Monroe,	AHEA
6. Ms. Nancy Chapman R.D.,	APHA
7. Dr. Ruth Matthews,	AACC
8. Ms. Elizabeth Randall,	APHA
9. Ms. Mary Klatko,	ASFSA
10. Dr. William Marion,	CAST
11. Elizabeth Shipley-Moses	SNE

Invited Observers:

Dr. Eleanor Pao	USDA/HNIS
Dr. Suzanne Harris	USDA/FCS
Dr. Catherine Woteki	DHHS/NCHS
Dr. Robert Rizek	USDA/HNIS

OTHER OBSERVERS: Free choice of breakout groups.

Mr. Robert Earl	-	ADA	Joanna Dwyer	-	ADA
Dr. Linda Meyers	-	DHHS/PHS	Dr. Kathryn Flemming	-	USDA/HNIS
Betty Peterkin	-	USDA/HNIS	Nancy Crane	-	DHHS/FDA
Dr. Robert Reese	-	USDA/HNIS	Dr. Theodore P. Labuza	-	IFT
Liz Turner	-	HCST	Dr. Catherine Adams	-	USDA
Julie Ostrowsky	-	OTA	Dr. Donna Porter	-	LOC/CRS
Dr. Roy Morse	-	IFT President	Dr. Richard Greenberg	-	IFT
Dr. Susan Berkow	-	FNB, NAS/NRC	Barbara Howell	-	BFTW
Lisa Watson	-	NDC	Mary Crane	-	AHA
Dr. Esperanza Briones	-	NIH	Charles Wixom	-	IFT

PROFESSIONAL SOCIETY DELEGATES:
(Listed in Alphabetical Order)

Dr. Richard Allison
American Institute of Nutrition

Dr. SueAnn Anderson
American Institute of Nutrition

Dr. Lynn B. Bailey
Institute of Food Technologists

Ms. Janet H. Bantly, R.D.
American School Food Service Association

Ms. Nancy Chapman, R.D.
American Public Health Association

Dr. Penny Kris-Etherton
American Dietetic Association

Dr. Joanna Dwyer
American Dietetic Association

Mr. Robert Earl, R.D.
American Dietetic Association

Dr. Helen Guthrie
American Institute of Nutrition

Ms. Jerianne Heimendinger
American Public Health Association

Ms. Mary Klatko
American School Food Service Association

Dr. Paul Lachance (Chairman of Workshop)
Institute of Food Technologists

Dr. William W. Marion
Council for Agricultural Science & Technology

Dr. Ruth Matthews
American Association of Cereal Chemists

Dr. Mary Monroe
American Home Economics Association

Dr. Susan Pilch
American Institute of Nutrition

Dr. Elizabeth Prather
American College of Nutrition

Dr. Elizabeth Prather
American College of Nutrition

Ms. Elizabeth Randall
American Public Health Association

Dr. Stephen Schiaffino
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Ms. Elizabeth Shipley-Moses
Society for Nutrition Education

Dr. Helen Smiciklas-Wright
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Dr. Patricia Swan
American Institute of Nutrition

Dr. Martha Taylor
Society for Nutrition Education

Ms. Ellen Thompson
American Public Health Association

Dr. Carol Windham
American Dietetic Association

NON-DELEGATE SCIENTISTS AND OBSERVERS:

Dr. Catherine Adams
USDA, Extension Service

Dr. Susan Berkow
Food and Nutrition Board, NAS/NRC

Dr. Esperanza R. Briones
DHHS, NIH Nutrition Coordinating Committee

Dr. Gerald Combs
USDA, Agricultural Research Service

Ms. Mary Crane
American Heart Association

Ms. Nancy Crane
DHHS, Food and Drug Administration

Dr. Kathryn Flemming
USDA, Human Nutrition Information Service

Dr. Richard Greenberg
Institute of Food Technologists

Dr. Suzanne Harris
USDA, Food Consumption Surveys

Ms. Barbara Howell
Bread for the World

Dr. Linda Meyers
DHHS, Disease Prevention and Health Promotion

Dr. Roy Morse
Institute of Food Technologists

Ms. Mim Nelson
Senate Committee on Agriculture

Ms. Julie Ostrowsky
Office of Technology Assessment

Dr. Eleanor Pao
USDA, Human Nutrition Information Service

Dr. M. Park
DHHS, Food and Drug Administration

Dr. Jean Pennington
DHHS, Food and Drug Administration

Dr. Betty Peterkin
USDA, Human Nutrition Information Service

Dr. Donna Porter
LOC, Congressional Research Service

Dr. Robert Reese
USDA, Food Consumption Research Bureau

Dr. Robert Rizek
USDA, Human Nutrition Information Service

Dr. Christopher Sempos
DHHS, National Center for Health Statistics

Dr. John Vanderveen
DHHS, Food and Drug Administration

Ms. Lisa Watson
National Dairy Council

Mr. Charles W. Wixom
Institute of Food Technologists

Dr. Catherine Wotecki
DHHS, National Center for Health Statistics

Dr. Elizabeth Yetley
DHHS, Food and Drug Administration

United States
Department of
Agriculture

December 1987

1987 Report on USDA Human Nutrition Research and Education Activities

A Report to Congress

PREFACE

This report was prepared under the auspices of the USDA's Subcommittee for Human Nutrition, Research and Education Committee of the Secretary of Agriculture's Policy and Coordination Council.

USDA Agency representatives who assisted in preparing this report were Gerald F. Combs, Agricultural Research Service; Marcia Gibney, Agricultural Marketing Service; Judith Putnam, Economic Research Service; Melody Bacha, Food and Nutrition Service; Doris Balinsky, Competitive Research Grants, Office of Grants and Program Systems; George Mountney, Cooperative State Research Service; Jim Krebs-Smith, Food and Nutrition Information Center, National Agricultural Library; Lillie Sheehan, Office of Information, Office of Governmental and Public Affairs; Betty Peterkin, Human Nutrition Information Service; Paul R. Crowley, Office of International Cooperation and Development; Marge Stanton, Higher Education Programs, Office of Grants and Program Systems; Ava Rodgers, Extension Service; Wells Willis, Food Safety and Inspection Service; and Suzanne Harris, Food and Consumer Services. Lorraine Walsh typed the report.

Copies of this report can be obtained from Gerald F. Combs, Chairperson, USDA, Subcommittee for Human Nutrition, Room 132, Building 005, BARC-West, Beltsville, Maryland.

Agency Abbreviations

Agency	Agency Abbreviation
Agricultural Marketing Service	AMS
Agricultural Research Service	ARS
Agricultural Stabilization and Conservation Service	ASCS
Cooperative State Research Service	CSRS
Competitive Research Grants Office	CRGO
Economic Research Service	ERS
Extension Service	ES
Food and Nutrition Service	FNS
Food Safety and Inspection Service	FSIS
Human Nutrition Information Service	HNIS
National Agricultural Library	NAL
Office of Governmental and Public Affairs	OGPA
Office of Grants and Program Systems	OGPS
Office of International Cooperation and Development	OICD

EXECUTIVE SUMMARY

Introduction

The provisions of section 1452(a) of the National Agricultural Research, Extension and Teaching Policy Act Amendments of 1985 (7 U.S.C. 3173 note) required the Secretary of Agriculture to submit to Congress in December 1986 a comprehensive plan for implementing a national food and human nutrition research program including recommendations relating to research direction, educational activities and funding levels necessary to carry out such plan.

Section 1452(b) requires the Secretary annually thereafter to submit a report on the human nutrition research activities conducted by the Department of Agriculture. This first report summarizes the Department's activities in human nutrition research and education during FY 1987. Emphasis is placed on new directions and highlights. No effort has been made to restate the detailed program plan as outlined in last year's report.

Human Nutrition Research

The USDA human nutrition research projects initiated, research highlights, and other research findings during fiscal year 1987 are presented for the following six areas:

- Human nutrition requirements
- Energy regulation and role of nutrients in health promotion
- Food composition and bioavailability of nutrients
- Food and nutrition monitoring research
- Food and nutrition information and education research
- Research on government policies and socioeconomic factors

The numbers of USDA research projects included in the Human Nutrition Research Information Management System for FY 1986 are presented for different Federal nutrition code categories.

USDA research is uniquely equipped to find solutions to national nutrition problems linked to the food supply. Research findings are summarized concerning nutritional requirements, food composition and bioavailability of nutrients, food consumption trends, nutritional status assessment, and nutrition education methods which focus directly on these problems.

Human Nutrition Information and Education

In FY 1987, the eight or more USDA agencies largely responsible for food and nutrition information and education continued programs to meet their clients needs. Improved communication and cooperation among agencies on information and education projects was promoted, especially by the Subcommittee for Human Nutrition of the Committee on Research and Education and by the Assistant Secretaries for Food and Consumer Services and for Science and Education.

The USDA activities are summarized by new initiatives and ongoing programs. For example "Improving Nutrition, Diet and Health" is one of eight major initiatives of the Extension Service.

Ongoing programs are presented under the following headings to illustrate the improvement in coordination around major goals. These are:

- USDA's responsibility to assure that the Federal government "Speaks with one voice" when issuing dietary guidance.
- Improved linkages between research and information and education activities.
- Coordinated delivery of message.

Funding levels

The expenditures or estimated expenditures for human nutrition research and human nutrition information and education by the several USDA agencies for fiscal years 1983 through 1988 are given. The total amount of human nutrition research support by USDA has increased from $47.8 million in FY 1983 to $61.5 million in FY 1988, or an increase of 28.7 percent. During the same period, USDA support for human nutrition information and education has increased from $120 million to $137.5, an increase of 14.6 percent. Most of the funds for information and education activities were distributed to and managed by State agencies. The total USDA support for human nutrition in FY 1987 was $191.0 million and is estimated to be $199.0 million in FY 1988.

Coordination

Coordinating mechanisms and advisory bodies used during FY 1987 are described. These are grouped as follows:

- Coordination within the Federal sector
- Coordination within USDA
- Coordination with the private sector
- Advisory groups

Much progress has been made in achieving coordination with other agencies, Departments, and the private sector in order to provide satisfactory services within available resources.

1987 ANNUAL REPORT ON USDA HUMAN NUTRITION RESEARCH AND EDUCATION ACTIVITIES

A REPORT TO CONGRESS

I. INTRODUCTION

A. Charge

A U.S. Department of Agriculture (USDA) comprehensive plan for implementing a national food and human nutrition research and education program was submitted to the Congress in December 1986 in accordance with the provisions of section 1452(a) of the National Agricultural Research, Extension and Teaching Policy Act Amendments of 1985 (7 U.S.C. 3173 note). Section 1452(b) requires the Secretary annually thereafter to submit a report on the human nutrition research activities conducted. Accordingly, this report endeavors to summarize the USDA human nutrition research and education activities during FY 1987, with emphasis on new directions and highlights. No effort has been made to restate the detailed program plan as outlined in last year's report.

B. Legislative

USDA has had no new legislative mandates or change in mission since the 1986 report. The "National Nutrition Monitoring and Related Research Act of 1987" (S-1081 and H.R. 2151 of the 100th Congress), if enacted, will have considerable effect on the agency's program. The Act requires the Secretaries of USDA and the Department of Health and Human Services (DHHS) to develop a comprehensive plan for monitoring with numerous "minimum components", to establish an advisory council, and to publish jointly approved dietary guidelines and guidance.

C. Changes in Resources or Infrastructure

1. Children's Nutrition Research Center (CNRC) Building Nearing Completion

The CNRC building under construction in Houston, Texas, was topped out in March 1987 and the projected completion date is for the second quarter of FY 1988.

This is an 11-story building with a 3 level underground parking garage and a tunnel/elevator pod connecting it to the Texas Children's Hospital (TCH). The building is located on approximately .97 acres of land leased from the Texas Medical Center. The gross area of the building is approximately 208,000 square feet which provides 131,774 net square feet of space for 5 general categories of use: research, education, offices, research support, and administrative support. More than 50 percent of the facility is dedicated to research. The structural frame of the building will be reinforced concrete clad in a skin of glass and natural Texas granite.

2. Cooperative State Research Service

Reference, pages 16-17, section II.B.2., 1986 report to Congress "USDA Comprehensive Plan for a National Food and Human Nutrition Research and Education Program," this section is updated as follows:

"The Higher Education Programs office (HEP) is charged with informing the Secretary of the Nation's needs for scientific and professional expertise in the food and agricultural sciences, and developing and administering programs to assure the Nation of an outstanding cadre of food and agricultural scientists and professionals. The following activities of HEP relate to food science and human nutrition:

- o Administering competitive institutional grants awarded through peer review to support graduate training in food science and human nutrition. The purpose of the Competitive Graduate Fellowship Program is to increase both the number and the quality of future graduates trained at centers of excellence.
- o Serving as a resource for various Federal agencies, organizations, and the public seeking information concerning higher education related to food and human nutrition (academic programs, degrees granted, students enrolled, faculty statistics, career opportunities, etc.)
- o Enhancing the data (students, faculty, programs, etc.) essential to education planning, resource allocation, and evaluation by working with professional organizations and Federal agencies concerned with higher education in food science and human nutrition in order to standardize survey methodology and procedures, ensure accurate information for policy making, and reduce the data collection burden.

Contact: Marge Stanton, Higher Education Programs -- 202/447-6020"

3. Agricultural Marketing Service (AMS) Initiated Consumer Information Service

AMS added to its information staff to provide radio, TV, and press services through the Department's Office of Information. One of the staff's activities is to reach consumers with information on how to buy food.

II. HUMAN NUTRITION RESEARCH ACTIVITIES

The USDA human nutrition research has traditionally been linked with the nutritive value of foods, human nutrition requirements, and the kinds and amounts of foods that Americans consume in relation to their requirements and plans for improving diets. USDA is uniquely equipped to find solutions to national nutrition problems linked to the food supply. Its research findings on human nutrient requirements, food composition and bioavailability of nutrients, food consumption trends, nutritional status assessment, and nutrition education plans have contributed directly to the prevention or solution of these problems.

The information gained from human nutrition research forms the basis for dietary guidelines and for developing nutrition education programs for professionals and consumers. Such information is required to develop improved plant and animal food products that will support optimal health and well-being and to devise optimal food assistance programs for those most at risk.

A computer search by nutrition codes was made on October 20, 1987, of the 1,003 USDA projects included in the Human Nutrition Research Information Management System (HNRIMS). The results are shown in Table 1. This table

Table 1

USDA Research in Human Nutrition
(from HNRIMS, October 20, 1987)

	USDA Projects*		USDA Projects
HNRIMS Nutrition Code Area	Number	%	% of Federal Research in Area
Normal Human Requirements for Nutrients			
1. Maternal	47	5	26
2. Infant and Child	53	5	16
3. Adolescent	19	2	24
4. Adult	62	6	53
5. Elderly	28	3	19
13. Nutrition and Function	80	8	24
14. Nutrient Interactions	133	13	24
Energy Regulation and Role of Nutrients in Health Promotion			
6. Cardiovascular Disease and Nutrition	54	5	11
7. Cancer	27	3	4
8. Other Diseases (Osteoporosis, Diabetes)	36	4	7
11. Obesity, Anorexia and Appetite Control	28	3	8
17. Carbohydrates	64	6	30
18. Lipids	131	13	23
20. Proteins and Amino Acids	125	12	28
21. Vitamins	92	9	15
22. Minerals and Trace Elements	184	18	37
24. Fiber	44	4	54
Food Composition and Bioavailability of Nutrients			
26. Food Composition	240	23	78
27. Bioavailability of Nutrients	113	11	60
28. Effects of Technology on Nutritional Characteristics of Food	317	32	94
29. Other Food Science Research	153	15	85
Food and Nutrition Monitoring Research			
16. Nutritional Status	130	13	32
30. Food Consumption Surveys	42	4	58
31. Dietary Practices, Food Consumption Patterns	92	9	30
Food and Nutrition Information and Education Research			
32. Methods for Informing Public About Nutrition	18	2	21
33. Other Nutrition Education Research	14	1	36
Effects of Gov. Policy and Socioeconomic Factors			
34. Effects of Gov. Policy and Socioeconomic Factors on Food Consumption and Nutrition	35	3	76

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*Numbers are not additive as projects may be assigned more than one nutrition code (1,003 USDA research projects in system).

lists the number of USDA projects by category under six research areas. It also gives the percentage of the total number of research projects in HNRIMS for all Federal agencies represented by USDA projects, by nutrition code category. These include projects conducted by the State agricultural experiment stations and 1890 land-grant institutions and Tuskegee University, some of which receive no Federal funds. Total Federal funds expended by USDA for human nutrition research and education in FY 1987 amounted to $191.9 million (see table 2).

A. Human Nutrition Requirements (ARS, CSRS)

USDA intramural research in human nutrition has contributed significantly to the development of information now available on human requirements for many essential nutrients by age and sex. In fact, the estimated safe and adequate ranges of daily dietary intakes for selenium, copper, and chromium, as well as the Recommended Dietary Allowances for iron and zinc, are based largely on USDA studies. In addition, requirements for vitamin B-6, folacin, and vitamin C in women; vitamin D, vitamin K, calcium in the elderly; and energy and protein needs of infants and lactating women are being further studied and refined. Studies are underway on iron and molybdenum in men and boron in postmenopausal women. Such information about nutrient requirements of humans is used in providing better nutritional guidance, more nutritious foods, and better nutrition.

The Children's Nutrition Research Center at Baylor College of Medicine, Houston, TX, is dedicated to the study of nutritional needs of pregnant and lactating women and of infants and children, with particular attention to the quantification of nutritional needs for optimal nutritional status and performance. A unique facility within the Center is the Stable Isotope Laboratory which has the capacity to measure nutrient needs in a non-invasive manner with precision. The Center has studied energy, protein, and calcium needs of lactating women and infants, and devised new methods for measuring body protein and fat in infants.

The Human Nutrition Research Center on Aging at Tufts University, Boston, MA, has a mission to determine the nutrient needs of the elderly and the relationship of dietary factors to the aging process. Studies have been initiated on the requirements for vitamin D, vitamin K, folacin, protein, and calcium in the elderly. Other studies are being directed to the manner in which diet can delay or prevent the onset of degenerative conditions associated with aging.

The Grand Forks Human Nutrition Research Center develops recommendations for nutrient intakes by humans and identifies useful forms from food sources, particularly of minerals. This Center has provided highly relevant information on the dietary needs for zinc, copper, iron, and, more recently, boron.

The Beltsville Human Nutrition Research Center focuses on the requirements in humans of selenium, chromium, copper, biotin and vitamin E and the bioavailability of nutrients in foods.

The Western Human Nutrition Research Center continues studies to refine the dietary requirements for vitamin B-6, folacin, vitamin C, dietary lipids, iron, copper, and zinc.

The Cooperative State Research Service, through its Competitive Research Grants Office (CRGO), awarded 24 new and 3 continuing grants in human nutrition, totaling $2,253,396 in FY 1987. New grants ranged in size from $40,000 for 1 year to $270,000 for 3 years. The majority of the grant proposals received dealt with vitamins or minerals. Eleven of the new grants were awarded for projects relating to vitamins, and six to minerals.

1. Research Initiated

o Studies on Maternal Diet and Low Birth Weight Infants

An epidemiological investigation which will collect information on dietary intakes and nutritional status of mothers in a population with a high incidence of low birthweight is being initiated. This will be the first stage of a series of investigations on the role of maternal diet on the outcome of pregnancy at the Children's Nutrition Research Center (CNRC).

o Consequences of Suboptimal Trace Element Nutrition

The importance of trace elements, with emphasis on zinc, copper, and boron will be determined for normal physiological function of various animal and human systems including the cerebrovascular system; for normal biochemical function of various cellular components including cell membranes; and for the maintenance of normal morphology of body structures including bone and brain.

Animals will be fed diets in which the amounts of specific trace elements and other selected nutrients and non-nutrients are accurately controlled and systematically varied. The response of the animals to the dietary manipulations will be ascertained by performing various biochemical, physiological and anatomical methodologies.

o Micro-Nutrient Requirements of the Elderly

Human subjects are used to study the vitamin K and vitamin B-6 requirements of the elderly. Vitamin A, vitamin K, and vitamin D metabolism also will be studied in animal models.

o Vitamin A Requirement

A number of strong proposals dealing with vitamin A were received by CRGO. This vitamin has long been recognized as important in growth and development, vision, and possibly protection against cancer. Previous work supported by USDA's CRGO program has led to important discoveries of the possible functions of vitamin A, and of improved methods of determining body reserves. These programs will continue. A new, more sensitive method has been devised for separating and quantitating the various forms of vitamin A, and this will be used to determine more precisely total body stores of the vitamin, especially in cases of marginal vitamin A in the diet (as in underdeveloped countries), or subtoxic levels (as may be observed in people taking megavitamin doses in an attempt to protect against disease).

Other ongoing studies which will be continued deal with the function of vitamin A in growth and development. It has been shown that the vitamin is involved in regulation of important cellular proteins found at the surface of the cell, which may affect differentiation. It is thought that vitamin A directly affects gene expression of the protein fibronectin. New projects initiated this year include an examination of the relative effectiveness of dietary b-carotene and vitamin A on increasing tissue vitamin A level; determination of whether photosensitizers like vitamin B-2 increase vitamin A requirement by increasing light induced loss of vitamin A; and determination of the function and metabolism of vitamin A in the small intestine. For this latter project, the exciting modern technique employing monoclonal antibodies will be used to localize vitamin A in the intestine.

- Behavioral Effects of Nutrient Imbalance

Other new areas funded in FY 1987 by CRGO deal with the behavioral effects of nutrient deficiency or imbalance. The effect of amino acid imbalance on brain neurotransmitters and the subsequent effects on human disorders of food intake, leading to anorexia or overeating, is an important one. These studies complement ongoing studies of the effects of maternal vitamin B-6 deficiency on development of brain neurotransmitters in the offspring. The effect of marginal zinc deficiency in infants is also important and will be studied; behavioral changes and developmental delays have been shown to occur in mild zinc deficiency.

2. Research Highlights

- Boron Needed for Mineral Retention

Studies with animals at the Grand Forks Human Nutrition Research Center have shown that the trace mineral boron is involved in mineral metabolism and response to high dietary aluminum and low dietary magnesium. Bone calcification is affected. As a followup, a recent study was conducted in a metabolic unit with 13 postmenopausal women fed a low boron diet made from conventional foods, but low in fruits and vegetables. When boron was added to the diet after 119 days on the low-boron diet, the serum estradiol 17 beta concentration doubled and the loss of calcium, phosphorus, and magnesium in the urine decreased. The findings suggest that boron affects calcium, phosphorus, and magnesium excretion and that ample boron supplied by fruits and vegetables may help to reduce the risk of osteoporosis.

- Foods With Non-Radioactive Labels Used to Study Metabolism in Infants

Human milk and rice have been labeled with non-radioactive isotopes. They are being used in lactating women and infants and allow detailed study of important questions, for example, how human milk protects infants against infections.

- Vitamin D May be Low in the Elderly

Studies at the USDA Human Nutrition Research Center for Aging indicate that a significant number of the elderly are not receiving adequate levels of vitamin D from dietary and solar sources. Aging appears to decrease the capacity of human skin to produce vitamin D-3. Studies reveal an inverse relationship between the concentrations of provitamin D-3 in the epidermis with age, indicating that aging decreases the capacity of human skin to produce vitamin D. Exposure to sunlight only during the months of March through October in

Boston resulted in conversion of provitamin D-3 to previtamin D-3, with none occurring during the period from November to March. Deficiency of vitamin D leads to loss of calcium from the bones and may result in osteoporosis and bone fractures. In a recent study, 40 percent of patients entering a Boston hospital had little or no vitamin D in their blood. Decreased milk consumption is the major cause of age-related vitamin D deficiency, followed by reduced exposure to the sun.

o Selenium Requirements

The data for establishing the selenium requirement of adult humans was reviewed. Healthy North American men and women need about 80 and 57 micrograms of selenium per day to maintain balance. This amounts to approximately 1 microgram of selenium per kilogram of body weight daily. On the other hand, selenium intakes as low as 24 and 9 micrograms per day were sufficient to maintain balance in New Zealand women and Chinese men, respectively. In China, dietary selenium intakes were reported to be about 8 and 19 micrograms per day for adult males in endemic and non-endemic Keshan disease areas, respectively. Repletion of Chinese men of very low selenium status with graded levels of selenomethionine revealed that plasma glutathione peroxidase activity plateaued at similar values in all groups given 30 or more micrograms of supplemental selenium daily. On this basis, a physiological selenium requirement of about 40 micrograms per day was suggested for Chinese adult men.

o Nutritive Intake of Breast Fed Infants

Energy intakes of breast-fed infants remain significantly below current recommendations (about 15-20%) even after the ad libitum introduction of solid foods to supplement breast milk. These findings strongly suggest that present estimates of energy requirements of infants is excessive.

3. Other Findings

o Premature Infants May Require Pyridoxal Phosphate

It has been found that premature infants are unable to convert pyridoxine (the form usually present in vitamin supplements) to the active form, pyridoxal phosphate. This is a significant discovery and may have a significant positive impact on the survival of such children. The proposed mechanism of action needs confirmation.

o Exercise Increases Chromium Need

Results obtained indicate that regular exercise may increase chromium uptake and excretion and that high sugar diets also increase chromium excretion. The biologically active form of chromium involved has not yet been established.

o Vitamin B-12 Requirements

Studies on the bioavailability of vitamin B-12 were done at the USDA Human Nutrition Research Center on Aging at Tufts University, Boston, in humans with mild atropic gastritis, a commonly observed condition among the elderly. Radiolabeled crystalline vitamin B-12 was found to be absorbed equally well

(20%) in normal controls and subjects with atropic gastritis. Protein-bound vitamin B-12 absorption was 10-15 times less bioavailable than crystalline vitamin B-12 in both control and persons with atropic gastritis. However, subjects with mild atropic gastritis absorbed significantly less of vitamin B-12 bound to chicken serum protein than did controls. This uptake of protein bound vitamin B-12 in subjects with atropic gastritis was improved comparable to that of normal controls after tetracycline therapy for 10 days. The antibiotic had no effect on absorption of protein bound vitamin B-12 in controls. It appeared that the small amount of vitamin B-12 released from chicken serum protein was metabolized by intestinal bacteria in individuals with mild gastric atrophy.

o Vitamin C Requirements

A 14-week study was conducted on vitamin C requirements of 11 healthy males kept in a live-in metabolic ward at the Western Human Nutrition Research Center. Using controlled intakes of 5 to 605 milligrams of ascorbic acid per day over 14 weeks, daily intakes of 41 and 138 milligrams were calculated to maintain plasma ascorbic acid at levels above 0.4 and 1.0 milligrams per deciliter, respectively. Propensity for the gums to bleed or become inflamed upon probing was reduced as dietary ascorbic acid was increased through all levels. However, urinary hydroxyproline, a pre-scorbutic measure of collagen turnover, was undisturbed on both the normal and high levels.

o Absorption and Utilization of Dietary Carbohydrates by Young Infants

The ability of one-month old infants to digest and absorb short and long chain glucose polymers has been compared. Short chain glucose fractions are well utilized and the majority of the infants tested were able to digest the long chain polymers, although this may involve colonic fermentation.

o Role of Dietary Fat in Human Milk Production

The caloric value of human milk is strongly dependent on its fat content, and fat is the single most variable nutrient component in milk. Studies in lactating women using non-radioactive labeled fats, have revealed that about 30 percent of human milk fat is derived directly from dietary lipids, 10 percent from endogenous mammary synthesis and 60 percent from body lipid storage sites in the body. Accordingly, the fatty acid composition of breast milk may be influenced by the amount and type of dietary fat consumed during lactation.

o Zinc Status During Pregnancy Studied

Studies in the pregnant ewe indicate that inadequate zinc status may contribute to poor pregnancy outcome in humans. Low zinc intakes in pregnant ewes resulted in abortions, malformations, intrauterine growth retardation, and fetal mortality. Improved sensitive methods for assessing marginal zinc status also were studied. The most promising indicators are the increased activity of mannosidase and angiotension converting enzyme with addition of zinc to plasma *in vitro*.

B. Energy Regulation and Role of Nutrients in Health Promotion (ARS)

1. Research Initiated

o Direct Calorimeter for Human Studies

Recently, the Beltsville Human Nutrition Research Center has completed a room-sized calorimeter that permits the accurate direct measurement of energy production by humans under various conditions. These direct measurements will permit improvement in assessing the energy values in typical mixed diets. A systematic revaluation of the energy content of foods is also underway. The Beltsville calorimeter will be used to characterize the extent to which energy expenditure of individuals is influenced by season, activity, adaptation to diet and by body composition.

o Effects of Dietary Fat Intake

Several recent studies have shown that diets low in total fat and saturated fat and high in dietary fiber result in lower levels of serum cholesterol and other serum lipids, risk factors associated with coronary heart disease. Blood pressure was also reduced when dietary fat level was lowered and the ratio of the polyunsaturated to saturated fatty acids increased. Lean meat trimmed of separable fat and fat-free milk did not increase serum cholesterol levels when included in low-fat diets.

The Lipid Nutrition Laboratory of the Beltsville Human Nutrition Research Center has conducted studies to determine the effects of dietary fat level and type on metabolism and other related physiological parameters in free-living human volunteers and experimental animal models. Major changes in fatty acid profile of phosphoglyceride, triglyceride, cholesterol ester and free fatty acid fractions of human plasma were observed as a result of consuming eicosapentaenoic, a polyunsaturated fatty acid found in marine fish oils. These investigations may prove useful to evaluate the popular use of marine oil supplements in human diet. Methods with high precision and reliability were developed to detect prostaglandin metabolites in urine; these methods are useful in the area of lipid metabolism in humans. Scientists of the laboratory further demonstrated that a rat diet containing 4 percent menhaden oil increased eicosapentaenoic acid from zero to 8-10% of the total fatty acids in the platelet membrane phospholipids.

o Calcium Loss from Bones

Investigators at the USDA Human Nutrition Research Center at Tufts University, using dual photon absorptiometry have measured bone density of the spine in 76 healthy postmenopausal women at 7 month intervals. Women with calcium intakes less than 405 milligrams daily lost spine density at a significantly greater rate than did women with calcium intakes over 777 milligrams per day. There appears to be a threshold of calcium below which increased calcium intake is likely to be beneficial in reducing spine mineral loss. To define the relationship between calcium intake and rate of axial bone loss, a longitudinal intervention study involving 360 postmenopausal women has been initiated. In this study, 500 milligrams of supplemental calcium is being administered in two forms over a 5-year period. Physical activity, blood pressure, bone density, spine fractures and other aspects of calcium metabolism will be measured.

o Effects of Dietary Fatty Acids on Platelet Function and Eicosanoid Biosynthesis

Studies have been initiated to elucidate the mechanisms responsible for the physiological effects of dietary lipid modifications by studying the associated qualitative and quantitative changes of eicosanoid metabolism of essential fatty acids and to determine to what extent n-6, n-3, and n-9 series fatty acids influence the formation of those eicosanoids (thromboxane, prostacyclin), which are relevant to the onset and progression of the cardiovascular disease.

Studies with rats suggest that a selenium-deficient diet can result in an increase in the platelets of proaggregatory thromboxane and a decrease in antiaggregatory prostacyalin due to reduced glutathione peroxidase levels.

o Cholesterol Removal from Dairy Foods

Studies have been initiated to develop a cholesterol assimilating microorganism used in food production by genetic technology. Sixty lactic acid producing bacterial strains were evaluated systematically for growth in the presence of bile acids, a compound derived from cholesterol. However, none of the resistant organisms were able to use cholesterol from the substrate provided. Gene transfer techniques were then developed to facilitate transfer of bile acid resistance from lactobacilli to the more widely used streptococci. Strains were successfully transfected with plasmid DNA carrying identifiable phenotypic markers. If such an organism can be used to degrade the preformed cholesterol and lactose at the same time, an improved nutritional dairy product can be developed.

o Immunocompetence and Nutritional Status Assessment

Human volunteers, maintained in a metabolic ward, and fed diets marginally adequate in specific essential nutrients will be studied to determine if an immune response test may be used to detect marginal nutrient deficiency or nutritional status. *In vitro* and *in vivo* indices of immune status will be studied. Lymphocytes and macrophages isolated from peripheral blood will be cultured *in vitro*. The growth stimulation by T and B cell specific mitogens and interluken 1 and 2 secretion into the culture media will be determined. Levels of circulating immunoglobulins, secretory immunoglobulins, delayed type hypersensitivity and complement activity will be monitored. Some studies also will be done using animal models.

2. Research Highlights

o Body Composition Measurements in Infants

Two noninvasive techniques to measure body composition of infants have been developed and validated by scientists at the USDA Children's Nutrition Research Center, Baylor College of Medicine, Houston, Texas. One method which uses the acoustic plethysmograph to measure body volume, requires only 1 minute per measurement, has a low coefficient of variation and is reproducible on the same infant on consecutive days. The other method measures total body electrical conductivity (TOBEC), a rapid, safe and noninvasive method of estimation of fat-free mass. TOBEC uses an electromagnetic field to measure the amount of water in a subject's body, which is used to calculate the amount of fat. A correlation coefficient of 0.949 was obtained between the natural log of the TOBEC number and total body water determined by isotopic dilution technique using $H_2^{18}O$ in a study involving 16 infants. The TOBEC method is highly suitable for use with human infants and appears to determine body composition as accurately as other available methods. The standard technique of measuring body fat--underwater weighing--is inconvenient and inappropriate for very young or elderly subjects.

o Diet and Exercise in Weight Loss

The method used to evaluate weight reduction programs is inadequate as only total pounds of weight loss, rather than fat loss, are measured. To compare the relative effectiveness of two approaches to weight loss, two groups of moderately overweight women, living in a metabolic unit at the Western Human Nutrition Research Center were subjected to one of two programs. In one group the daily caloric intake was reduced by 50 percent to 1,200 kilocalories of metabolizable energy; in the other, the caloric intake was reduced by 25 percent to 1,800 calories per day and energy expenditure was increased by 25 percent through controlled exercise. Although the diet only group lost more total weight than the diet and exercise group, fat weight loss was the same between both groups. The diet alone group lost more body water and lean body mass than the diet and exercise group. The women in the exercise group were able to consume 50 percent more food and improve their fitness, yet achieve the same total fat loss as the group which restricted calories but did not exercise.

o Genetic Marker For Identifying Individuals With Greater Risk of Coronary Artery Disease (CAD)

Scientists at the USDA Human Nutrition Research Center on Aging, Boston, Massachusetts, have discovered a specific Apo A-I gene polymorphism associated with a high density lipoprotein (HDL) deficiency, a condition commonly observed in individuals with Coronary Artery Disease (CAD). Apo A-I is the major protein in HDL. This gene defect was found in only 4 percent of normals, 32 percent of CAD patients and 66 percent of individuals with genetic HDL deficiency. This finding is important as the genetic marker may be useful in identifying subjects at increased risk for CAD and recommending appropriate risk factor modifications.

o New Mechanism of Regulating Iron Uptake

USDA scientists at the Human Nutrition Research Center on Aging at Boston, Massachusetts, have found a protein which regulates messenger RNA for at least one of the two ferritin protein subunits. The amino acid structures of the two ferritin protein subunits (H and L) were established by sequencing the complete messenger RNA for each subunit harvested from rat liver. In rats not given extra iron, most of the messenger RNA is rendered inactive by this regulatory protein. Scientists have found that as soon as "free" iron is inserted into liver cells in culture, the inactive messengers engage with the cell ribosomes and the synthesis of subunit ferritin protein begins. The identification of a regulatory protein which is sensitive to unbound iron in the cell is an important breakthrough in understanding the mechanism of regulating iron metabolism and ferritin formation inside the cell. The binding of excess iron by ferritin prevents damage to cell components, notably lipids in membranes. Excess iron storage is sometimes a problem in the elderly. This effect of iron with aging is being explored.

- Components of Starch Maintain Normal Glucose Metabolism

Of the two components of starch, amylose and amylopectin, amylose has been found to improve the utilization of glucose and reduces the need for insulin in human subjects. In addition, certain blood fats are also decreased. Long-term consumption of foods high in amylose (beans, peas, and other legumes) may thus lower the risk of developing diabetes.

3. Other Findings

- Actual and Calculated Metabolizable Energy Values of Diets Compared

The metabolizable energy content of foods as published in USDA Handbook #8 are calculated from specific energy conversion factors derived by Atwater at the turn of the century for the fat, protein and carbohydrates of different food groups of the typical mixed diet. Since the composition of mixed diets consumed by the population changes, it was considered important to determine if these energy conversion factors still give an accurate indication of the metabolizable energy of the diet. Beltsville Human Nutrition Research Center scientists have found that when food lipids are mainly triglyceride, the heat of combustion of several lipid fractions from food products were within 2 percent of those determined by Atwater. However, when the food lipid had a high content of phospholipid, the values obtained were lower than those of Atwater. In several other studies, metabolizable energy measurements have been made on mixed diets consumed by human subjects. These have ranged from 7 to 12 percent lower than was obtained by calculation using handbook #8 values. USDA scientists are studying those factors that may be causing these overestimations so that appropriate corrections can be made.

- Diet and Cancer Risk

A quantitative measure of fecal mutagenicity in biological extracts has been developed and successfully tested. This is a rapid and reliable marker to estimate risk for bowel cancer. The test has been applied successfully to stools from human subjects on a variety of diets. The results may help to reduce cancer risk by dietary means. Also, a procedure for the isolation of genomic high molecular weight DNA from human stools was developed; this is a research breakthrough which has many potential uses in research on gene expression in human epithelium.

- Body Composition Measurement Techniques for Adult Humans

Body composition of large numbers of human volunteers will be measured by various methods including anthropometry, skin fold thickness, body density (under water weighing), 40-potassium counting, stable isotope dilution for body fluids, bioelectrical impediance and total body electrical conductivity (TOBEC). This is an effort to evaluate and validate the appropriate methods for specific uses.

Thus far, 1,500 subjects have been studied in the cross-validation project involving four Centers. The compact size of the bioelectrical impediance analyzer (BIA) makes it ideal for body composition measurements in field surveys. Good agreement between BIA and TOBEC was observed and these agree well with body composition as determined by body density or body water methods.

o Vitamin C Delays Cataract Formation

Eye lens opacification and cataract formation upon aging appears to be related to an inability to remove damaged proteins. Proteolysis by action of proteases provides a means of editing the cellular proteins and recycling amino acids of disposable proteins. Solar light (UVH and B) inactivate certain proteolytic enzymes and cause lens protein aggregation similar to that which occurs in cataracts. Elevated dietary ascorbic acid (vitamin C) was found to result in elevated lens ascorbate in guinea pigs and an enhanced ability to withstand UV-induced damage to lens protein and enzymes. This implies that attenuation of the protein catabolizing machinery may be causally related to the accumulation of damaged proteins which is associated with cataract formation and that dietary antioxidants may offer protection against these insults.

o Fatty Acid Metabolism Studied

A direct comparison of the metabolism of fatty acids present in our diets was done at the U.S. Northern Regional Research Center, Peoria, Illinois, by using mixtures of non-radioactive isotope labeled fats fed to adult male subjects. The results revealed that incorporation of saturated, mono- and polyunsaturated fats into blood lipid fractions are under tight biological control. Excess fatty acids not required to meet cell and membrane requirements are shunted into body fat or burned for energy. The results indicate that a large excess of polyunsaturated fat in the diet of healthy individuals has little nutritional benefit. Because of various control mechanisms, structurally rearranged polyunsaturated fat acids present in hydrogenated oils were found not to be a nutritional liability at the levels presently consumed. Two of the structurally different "trans" fatty acid isomers present in hydrogenated vegetable oils, when fed to mice, were found to be more like mono-unsaturated or saturated than polyunsaturated fats. They were efficiently absorbed but were not selectively incorporated into plasma lipid classes and were chain shortened 2 to 3 times more rapidly than similar fatty acids with a "cis" or unmodified structure.

o Fluidity of Lipoproteins Affected by Fat Level and Saturation

Erythrocyte ghost membrane fluidity and insulin binding were significantly increased when high levels of polyunsaturated fats were fed to healthy free-living premenopausal women. Low fat (20% of energy) diets in women yielded more fluid Low Density Lipoprotein (LDL) and High Density Lipoprotein (HDL) than did diets with high fat (40% of calories). Reducing fat intake lowered LDL cholesteryl linoleate and raised cholesteryl oleate content. Moderate vitamin E supplements reduced HDL fluidity in women but not men, both consuming self-selected diets. These findings will be important in planning dietary recommendations to prevent late-onset diabetes and heart disease as the membrane lipid environment effects on the insulin receptor constitute an interface between carbohydrate and lipid metabolism.

o Beneficial Effects of Human Milk for Infants

In an epidemiologic study, it was found that malnutrition is a primary factor leading to severe formula intolerance. Lactoferrin has been identified as the major protective protein in human milk which spares breast-fed infants from this problem of food intolerance. Lactoferrin is known to help infants absorb iron from mothers milk and to protect infants against intestinal infection. Results of the present study indicate that lactoferrin also stimulates growth and maturation of the gastrointestinal tract of the newborn.

C. Food Composition and Bioavailability of Nutrients (ARS, HNIS)

1. Research Initiated

o New Methods for Analyzing Trace Elements and Fiber in Foods

Atomic absorption using a pulsed continiuum source with a photodiode will be devised. The instrument will be used to analyze trace elements (in foods) in the far ultra-violet wave length region with a graphite furnace atomizer. The controversial iron spectral interference on selenium analysis will be evaluated. Also, a constant temperature carbon furnace atomizer combined with multielement atomic absorption/emission spectrometer will be evaluated for use in trace mineral assays on foods. In addition, a combination of selective extraction procedures, separation and characterization procedures, employing such techniques as chromatography and molecular spectroscopy and wet chemical methods will be used to develop new and improved procedures for analyzing fiber components in foods.

o Automated Analysis of Water-Soluble Vitamins in Foods

Studies have been developed for rapid-automated analysis of the different forms of vitamin B_6, and C in foods. The extraction of the high pressure liquid chromatography (HPLC) procedures developed for thiamine have been applied to a number of foods. A HPLC procedure has been developed for the separation and quantitation of ascorbic acid and isoascorbic acid in foods. Studies are underway to devise appropriate procedures to measure the different forms of folate in foods.

o Effects of Low and Medium Dose Irradiation on Vitamin Content of Pork and Poultry Products

Protocols for response surface analysis of the effects of ionizing radiation on the vitamin contents of refrigerated pork and poultry have been developed. Pork chops and chicken breasts were subjected to radiation doses of 0, 50 (pork only), 175, 350, 525 or 700 kilorads at temperatures of -20°, -10°, 0°, and 10° and 20°C. Vitamins to be measured include thiamin, riboflavin, niacin, pyridoxine, and vitamin B-12.

o Trace Mineral Absorption and Retention in Lactating Women

The absorption and retention of the trace elements copper, chromium, selenium, and zinc will be assessed by the use of stable non-radioactive isotopes in a group of lactating postpartum women, a group of formula feeding postpartum women and a group of never pregnant women. Blood, urine, and milk samples will be analyzed for the uptake and retention of the stable isotopes of the above mentioned trace elements. Fecal samples will be analyzed for the copper, selenium, and zinc stable isotopes to determine the absorption of these trace elements.

o Bioavailability of Nutrients in the Elderly

Using animal models and human subjects, the effect of atrophic gastritis on the absorption of calcium, folacin, and vitamin B-12 will be measured. In addition, such factors as fiber or fat influence on absorption of nutrients such as vitamin A and pyridoxine will be studied.

o Mineral Bioavailability and Requirements in Humans

Studies are underway to assess the absorption and utilization of zinc, copper, iron, calcium, and magnesium in adult humans using stable non-radioactive isotopes. It has been found that zinc absorption is much less efficient in the elderly although 15 milligrams of zinc daily is adequate for both young and old adults. Zinc was not found to inhibit copper absorption at the recommended level of intake. Nor did a high level of vitamin C intake (600 mg/day) inhibit copper absorption. Copper aborption was observed to vary from 75% to 12%, as the level ingested per day was increased from 0.6 mg to 8.0 mg, respectively.

2. Research Highlights

o Food Composition

USDA continues to maintain tables on nutrient composition of foods. These tables are widely recognized and used throughout the world. The National Nutrient Data Bank (NNDB) has been expanded to include results from new analyses conducted by industry, government, universities, and from extramural studies funded by HNIS to fill data gaps. Products of the NNDB are reference values for over 60 food components in thousands of foods Americans consume. They are presented in published and machine readable forms for a variety of uses and users. Of special importance are the data bases prepared for use in assessing the nutrient content of diets reported in large scale surveys conducted by HNIS and by the National Center for Health Statistics (NCHS) in DHHS. A Memorandum of Understanding between HNIS and NCHS signed this year defines cooperation in this area.

Suitable methods have been developed for sampling and analyzing those foods that provide important amounts of nutrients to diets of Americans. The marked increase in number of processed foods, changes in consumer practices, and the need to have more specific information about components in foods (including fatty acids, carotenoids, and dietary fiber) has required increased effort.

o Nutrient Interactions

Research in humans has been initiated on interactions of nutrients with other components in foods and the effect on availability for absorption and use by the body. This research has included the effects of fiber, phytate, and oxalate found in foods on the availability of calcium, iron, zinc, and copper. In addition, fructose, a simple sugar that occurs in fruits and honey, has been found to markedly exacerbate the effects of low copper levels, presumably by rendering it less available for metabolism. This information is important in applying requirement data to individuals consuming different food mixtures.

o Copper Fructose-Sex Interaction

Scientists at the Beltsville Human Nutrition Research Center have found that the feeding of fructose, but not glucose or starch, greatly exacerbates the symptoms associated with a copper deficiency in male rats. The most dramatic sign of copper deficiency in male rats fed diets high in fructose is sudden death due to rupture of the heart. A study was conducted with female, as well as male rats, to determine if females might be less affected, since human premenopausal women have a lower incidence of heart-related abnormalities. Mortality occurred only in the male rats fed the fructose diet low in copper, with 40% dying during the 8-week study. Plasma ceruloplasmin activity, erythrocyte superoxide dismutase activity, and hepatic copper concentrations were reduced to a similar extent in all rats, regardless of sex or type of dietary carbohydrate fed. The results suggest that female rats are apparently protected from the lethal consequences of a fructose copper deficient diet observed in their male counterparts. Also, feeding rats diets with fructose in place of starch increased by 3-fold the level of dietary copper required for a normal immune response.

o Copper-Vitamin Interaction Studied

Studies conducted with women between the ages of 18 and 36, housed in a metabolic unit and fed diets containing from 0.67, 1.47 and 2.67 milligrams of copper with 90 and 1,500 milligrams of vitamin C per day at the Grand Forks Human Nutrition Research Center revealed no differences in copper or iron balances. It was found that the specific activity of ceruloplasmin, diamine oxidase and the activity of cytochrome-C oxidase in platelets and mononucleated white cells are more sensitive indicators of copper status than plasma copper or erythrocyte superoxide dismutase, and that vitamin C supplements do not markedly affect commonly measured indices of iron and copper.

3. Other Research Activities and Findings

a. Research to Improve Foods for Use in Overseas Distribution Programs (ARS, OICD)

USDA procures approximately two million tons per year of agricultural commodities which are shipped overseas through PL-480, Title II, for use in emergency relief and nutrition oriented feeding programs. Many of the commodities are fortified with protein, vitamins and minerals to help alleviate known nutrient deficiencies among the food recipients.

Recent research in Indonesia suggests that vitamin A is of greater significance than previously believed in reducing morbidity and mortality among young children. Based on these findings, USDA, working in cooperation with the U.S. Agency for International Development, has examined additional foods which can serve as carriers for vitamin A. As a result, soy fortified bulgar wheat and sorghum grits, which are distributed through PL-480, Title II, are now fortified with vitamin A, as well as other vitamins and minerals, and research is being undertaken to explore fortification of wheat distributed by the U.S. in Bangladesh. A new commodity, instant corn-soya-masa flour, which is fortified with vitamin A and other micronutrients, has also been programmed for distribution this year. In addition, vitamin A fortification of foods processed in developing countries, including rice and monosodium glutamate (MSG), is under study through USDA's Office of International Cooperation and Development.

b. Research to Provide Food Composition Data Bases (HNIS)

- Composition of Legumes and Fish

New data on the composition of legumes and legume products and of finfish and shellfish were compiled, evaluated, and used to revise values published in "Composition of Foods...Raw, Processed, Prepared," Agricultural Handbook No. 8 (AH-8). Values were published in two revised sections (AH 8-15 and AH 8-16). Computerized data sets for the new sections were issued and the Nutrient Data Base for Standard Reference was revised accordingly.

- Sugar Content

"Sugar Content of Selected Foods: Individual and Total Sugars," Home Economics Research Report No. 48, presents newly compiled data on simple and complex sugar fractions, as well as total sugar contents for over 500 food items. This is the first comprehensive table of the sugar content of American foods.

- Special Data Bases Prepared

Special data bases for use in assessing the content of food energy and 27 nutrients in diets reported in the Nationwide Food Consumption Survey 1987 were prepared. They incorporated current information on composition of edible parts of foods as purchased by households (the household data base) and foods as eaten at home and away from home by individuals (the individual data base). Data bases have been expanded since the last large survey in 1977-78 from 14 to 27 food components. The new data bases include several components currently of interest to nutritionists, such as fatty acids, cholesterol, dietary fiber, sodium, zinc, copper, carotenoids, vitamin E, and folacin. Values have been revised to reflect new and improved data (iron content of meat is somewhat lower than previously released, for example) and changes in foods marketed (examples are changes due to changes in enrichment standards and fortification levels, lower fat meats, changes in the fat trim and meats marketed, and carrot species with higher vitamin A content.) If analytical data were not available for a food in these data bases, values were inputed by HNIS scientists. Data tapes will be available for public use.

- Analyses were conducted to fill data gaps, especially on the composition of foods newly marketed or reported as consumed in national surveys. Examples are foods from fish fast food establishments, Mexican fast foods, fried chicken fast food establishments, and other fast food items; frozen prepared foods, cereal products and selected baked products, and raw and cooked mixed dishes.

- Food components receiving emphasis in extramural analyses were those believed to be important to health promotion and disease prevention for which data were insufficient to assess diets. For example, the carotenoid content of raw fruits and vegetables was determined and nutrient analyses of carbohydrate fractions in selected foods of plant origin were conducted. Studies of the selenium content of foods are underway.

- The adequacy of analytical data for assessing diets reported in 1985 food intake surveys was studied. The number of the several thousand food items that provided 80 percent of total intake varied by nutrient--from 33 for carotene to 217 for iron. Of the items covering 80 percent of intake, the percentage with values inputed by HNIS scientists because analytical data were unavailable varied: none for carotene, 10 percent for iron, 38 percent for dietary fiber, and 50 percent for vitamin E.

- HNIS scientists presented papers on their research and other NNDB activities at the Twelfth National Data Bank Conference and other national and international meetings, including INFOODS and the International Symposium on Horticulture and Human Health.

c. Research on Bioavailability and Interactions (ARS)

o Low-Copper-Fructose Interaction in Pigs

Beltsville scientists have evaluated the young pig as an alternate animal model for studying the low copper-fructose dietary interaction. Young pigs fed a semipurified low-copper diet containing 20% of calories from fructose exhibited marked lesions including a doubling in heart size in relation to body weight, increased liver iron, and histological changes in heart muscle. These lesions were prevented when glucose replaced fructose in the low-copper diet or when adequate copper was added. Studies aimed at elucidating the effects of dietary copper and carbohydrate on the expression of genes coding for proteins that function in the transport and storage of copper and iron have been initiated.

o Selenium Bioavailability

Selenium from wheat that was fertilized with selenium during growth (as occurs in Finland) is as available as selenium in unfertilized wheat. Bioavailability is measured by the ability of the grain to normalize rat hepatic glutathione peroxidase in deficient rats.

o Interactions of Dietary Fiber with Food Nutrients

Calcium pectate gels, under physiological conditions, bind bile acids similar to carrot residue cell wall material. Thus, pectin in both natural and processed forms can lower blood cholesterol. Pectin also was found to inhibit the precipitation of calcium phytate, promoting mineral bioavailability. Pectin inhibits the formation of fatty acid calcium salts as well. Pectin also increased the viscosity of the contents of the intestional tract which may partially explain the reduced rate of stomach emptying, digestion and absorption. Other studies have been conducted with cellulose, hemicellulose and fiber from fruits and vegetables.

o Iron Bioavailability from Soy Hulls

Iron in soy hulls, intrinsically or extrinsically labeled with ^{59}Fe, was found to be as effectively absorbed by human volunteers as bakery grade ferrous sulfate used for enrichment of bread. The soy hulls were incorporated into rolls served in a meal to the volunteers. This finding indicates that soy hulls could be used as a suitable iron source in human diets in contrast to wheat bran which reduced the bioavailability of iron, zinc, and calcium.

d. Other Food Composition Related Research (ARS)

o Automated Carotenoid Analysis of Foods

Automated and computerized methods to improve precision and accuracy of the analysis of carotenoids in foods were developed. Major carotenoids from five different vegetables (broccoli, cabbage, spinach, brussel sprouts, and kale) were separated, identified and quantitated using a variety of techniques. The abundant carotenoids present were neoxanthin, violaxanthin, lutein epoxide, lutein, beta-carotene and all-trans-lutein. Mild cooking (6 minutes in microwave oven) drastically reduced (30-40%) total carotenoid content of brussel sprouts and kale.

o Reference Standards Developed

Certified standard reference materials of known nutrient contents (mixed diet and bovine serum) have been prepared and turned over to the National Bureau of Standards. These reference materials have been distributed worldwide.

o Nutrient Composition Data

The Beltsville Human Nutrition Research Center's Nutrient Composition Laboratory provides essential data on the nutrient content of food by (1) developing appropriate methods for analysis of nutrients in foods; (2) developing sound sampling techniques to ensure that representative samples are analyzed; (3) analyzing the nutrient content of foods with tested, dependable assay techniques; and (4) conducting research on the effect of food processing, storage, and marketing methods, as well as home, institutional, and restaurant food preparation procedures on nutrient composition.

D. Food and Nutrition Monitoring Research

Food consumption by Americans was monitored and their diets were assessed for nutrient content as part of the National Nutrition Monitoring System (NNMS). Of the five major NNMS categories, USDA's role is prominent in three: food composition measurements (section C), food supply determinants (this section and section F) and food consumption measurements (this section). The Joint Operational Plan for the National Nutrition Monitoring System from 1987 to 1996 was sent to Congress. The Plan sets goals for the system, summarizes recent progress, and outlines plans (See D.2.b).

1. U.S. Food and Nutrient Supplies (ERS, HNIS)

o Estimated Per Capita Food Supplies

The estimates of per capita food supplies and their nutrient content for the year 1985 were added to the historical series of annual estimates since 1909. Almost all nutrients in the 1985 food supply were slightly higher than a year earlier. Largest increases were in fat (up 5 percent) and vitamin E (up 7 percent), primarily due to increased supplies of salad and cooking oils. Over the past two decades vitamin A supplies increased by over one-third, mainly reflecting increased supplies of dark-green and deep-yellow vegetables but also higher values of the new deeper orange colored carrots and sweet potatoes now marketed.

o Russian Food Supplies Calculated

The nutrient content of Russian food supplies was evaluated and compared with those of the United States.

2. Food Consumption Surveys (HNIS)

a. Methodological Research

(1) Research Highlights

o Research to improve the efficiency of surveys and accuracy of data has been sponsored by HNIS during the past decade. During the past year, efforts focused on bringing results of this research to the food, nutrition, and health communities through a symposium at the 71st Annual Meeting of the Federation of American Societies for Experimental Biology; participation in the third conference for Federally Supported Human Nutrition Research Units and Centers, and the Conference of the Association of State and Territorial Public Health Nutrition Directors; and preparation of a source book on the research, which is undergoing peer review. Experience gained during the last decade has confirmed the choice of the 3-consecutive-day dietary data collection methodology for use in the Nationwide Food Consumption Surveys (NFCS) and justified the methods used in the panel studies conducted as the Continuing Surveys of Food Intakes by Individuals (CSFII) in 1985 and 1986. Other research results indicated the need for further exploration. Results were reported in 1987 (HNIS Administrative Report No. 382).

(2) Research Findings

o M. A. Caliendo, University of Maryland, evaluated the validity of food recall information on diets of men with respect to men's ability to recall prior day's intake, effectiveness of measuring utensils and models as measurement aids, problem foods, and surrogate respondents. Men recalled about 85 percent of items actually eaten (unobtrusively observed). Errors of omission were more frequent than errors of addition. The measurement aids studied are used differently and are not interchangeable.

o A data collection contractor evaluated for completion rates, data quality, respondent burden, and processing, eight different approaches for collecting panel data--respondents recontacted several times during one year. Of the approaches, which involved collection by personal interview, telephone, mail, and combinations of these, the approach with the highest overall rating was an initial in-person contact to get a 24-hour recall and subsequent 24-hour recalls by telephone or in person if respondent has no phone.

o K. J. Morgan *et al*. evaluated effects of number of days intakes and methods of recording on intake levels using 12 days of data (3 consecutive days in 4 quarters of year) from the study described above. Benefits of additional days of intake were found to fall off importantly after 6 days.

- Another data collection contractor identified special problems of collecting panel data in the low-income population. Procedures that involved mail-in records, collection of data for more than a few days, and dependency on telephones were unsatisfactory.

- S. R. Johnson *et al.* established fundamental relationships between intakes of female household heads and other household members in 14 sex-age groups from NFCS 1977-78. Mean intakes by groups of female heads were strongly related to intakes by groups of other household members for 3 food components examined. Explanatory power was greater for groups 10 years and under and males 19 and over, but less for 11 to 18 year age groups.

- The HNIS-funded National Academy of Sciences (NAS) report "Nutrient Adequacy: Assessment using Food Consumption Surveys", 1986, made these recommendations: (1) develop multiple criteria of nutritional adequacy; (2) adopt a probability approach where feasible for analysis; and (3) use descriptive presentation of mean, variance and percentile distributions when no probability assessment can be made. The following steps have been taken: (1) the NAS has been requested to develop the multiple criteria required; (2) the inter- and intra-variability in dietary data from CSFII 1985 is being studied by Iowa State University and the University of Arizona; and (3) NFCS 1987 descriptive results will be presented as recommended.

- F. A. Larkin, University of Michigan, developed a 1-year retrospective food frequency questionnaire and studied the validity of results against mean results from 16 single days' data collected by recall and records. The frequency questionnaire overestimates intake compared to recall/record values. No one factor was identified to explain good or poor agreement between methods.

- L. Hoover, University of Missouri, studied consequences of using a nutrient data base of fewer foods in assessing nutrient content of diets for groups of individuals reported in surveys. Either a large data base of several thousand foods or a shortened data base tailored to consumption practices appears necessary. It is not clear that a shortened data base is cost effective because making substitutions may take as much time as coding foods from the longer list.

- Using ARS dietary intake data for 29 people for 365 consecutive days, P. Basiotis found the number of days of records required to "accurately" estimate individual and group intakes to vary widely by nutrient. Three days of intake were adequate for group estimates for most nutrients.

- The response by women 19-50 years in CSFII-85's panel approach of 6 contacts (one in person, the rest by telephone, if available) at about 2-month intervals was studied. Women tending to respond on more contacts were in nonmetropolitan areas, were in food assistance programs, had higher body mass index, were older, were in good to excellent health, had shorter first interviews and had subsequent interviews by telephone.

- A system for the use of lap-top microcomputers for the recording of certain data collected by interview in households in national surveys was developed, tested, and used in NFCS 1987. Data included demographic and other characteristics of households and individuals and recalls of household consumption during the 7-day period prior to the interview.

- Attempts to assess the effects of methodological and data base changes between 1977 and 1985 have not been totally successful. Problems occur because behavior change and methods change effects cannot be clearly separated and data base changes resulting from improved data and from real changes in foods cannot always be separated. Therefore, a "bridging" survey has been planned in which comparable samples of women will respond to surveys with two sets of procedures, one used in 1977 and one used in 1987, to help determine what, if any, method effects exist.

b. Collecting and Reporting of Survey Data (HNIS)

(1) Research highlights

- Survey activities were in three main areas: (1) preparation, documentation and release of public use data tapes and reporting of descriptive tabular results from the Continuing Survey of Food Intakes by Individuals (CSFII) in 1985 and in 1986; (2) launching and supporting technical aspects of data collection for the larger Nationwide Food Consumption Survey, 1987 (NFCS 1987) of household food use and food costs and food intakes at home and away by individual household members; and (3) planning for future activities conducted as part of the National Nutrition Monitoring System (NNMS).

(2) Research Activities and Findings

- CSFII. Five statistical reports and numerous articles and papers described the food and nutrient intakes and dietary practices by national samples of women and men 19-50 years and 1-5-year-old children. "Usual" diets as measured by 4 nonconsecutive days at 2-or-more-month intervals showed mean nutrient intakes by women, regardless of region or income, to be well below RDA for 6 nutrients: calcium, iron, zinc, magnesium, folacin, vitamin B-6. Fat provided less than 35 percent of energy in 33 percent of the women's intakes and less than 30 percent of energy in 12 percent of intakes. Women's mean cholesterol intakes were 300 mg/day and men's were 440 mg/day. Dietary fiber levels were 12 grams per day for women and 18 grams per day for men. Snacks and food away from home made major contributions of energy and of essential nutrients to diets of women, men, and children. Compared with NFCS 1977, 1985 food intakes by women were higher by 60 percent in skim and lowfat milk, 53 percent in soft drinks, 35 percent in mixtures mainly meat, poultry, and fish; 29 percent in grain products. They were lower by 35 percent in whole milk, 34 percent in meat reported separately and 28 percent in eggs. Generally, women with higher incomes and education were leaders in these consumption changes.

o NFCS 1987. A year-long survey of 6,000 households in 118 sampling areas in the 48 mainland States began April 1, 1987. Data are being collected by National Analysts Division of Booz, Allen and Hamilton, Inc. HNIS staff developed the survey instruments working closely with data users to maximize data usefulness and with other data providers to assure comparability or linkages to other sources of food and nutrition-related data. Over 100 individuals and groups who use or provide data were asked to peer review the survey design and instruments. Technical food information support files (food codes, volume-weight conversions, default values, and nutrient data) were updated. Microcomputers are being used to record major portions of the interview. A total of 14 5-day training sessions were held for interviewers and reviewers in Philadelphia, Chicago, and Los Angeles, and 2 sessions for food coders in Philadelphia with HNIS evaluators in attendance. Staff from USDA's FNS, from NCHS, and from USDA's the National Agricultural Statistical Service (NASS) observed the training. NASS, under special agreement, is cooperating actively in all aspects of survey planning and methodological development. All aspects of the sampling and data collection are being monitored by HNIS staff.

o NNMS plans. The CSFII 1985 and 1986 and NFCS 1987 are major components of the NNMS. An Operational Plan for NNMS from 1987 to 1996 was prepared under the direction of the Assistant Secretaries for Health (DHHS) and for Food and Consumer Services (USDA). The Plan's Calendar of Events highlights plans for monitoring activities into the mid-1990's by the two departments. USDA's role involves the following:

- Annual estimates of the food and nutrient content of U.S. per capita food supplies.

- Continuation of food composition research and measurements by HNIS and ARS.

- Reinstatement of a modified CSFII after NFCS 1987 data collection ends in 1988. CSFII of 1989 and each year through 1996 will obtain 3 days food intake data from all members in 1,500 households in the general population and an additional 750 households in the low-income population for a total of about 6,000 individuals each year. Results will be published annually using a moving average approach.

- CSFII followup telephone interview on consumers' attitudes and perceptions on diet/health issues (HNIS, FSIS, and FDA). This information will allow, for the first time, analyses to study links between attitudes about diet and dietary consumption on a national basis.

- CSFII's yearly surveys provide a potential for add-ons to study populations at nutritional risk. Such an add-on to study diets of the low-income elderly is planned for 1990.

3. Dietary Assessment Research (HNIS, ARS)

o Dietary status for the population as indicated by the nutrient content of per capita food supplies, the nutrient levels of food used by U.S. households and the nutrient intakes from food eaten at home and away by individuals was studied by the Joint Nutrition Monitoring Evaluation Committee and reported to the Congress in Nutrition Monitoring in the

United States in July 1986. (Results were summarized in the "USDA Comprehensive Plan for a National Food and Human Nutrition Research and Education Program: A Report to Congress," pages 83-85). The review and scientific interpretation for the second report, to be completed in 1989, will be prepared under contract by a scientific organization funded jointly by USDA and DHHS. The scope and emphasis of the report was defined and the contractor selected in 1987. Agencies conducting monitoring activities will provide the contractor with tabular and analytical results from surveys and results from methodological research for use in the report. New information on dietary status since the 1986 report on dietary status will focus on CSFII results (D.2.b. reported above and D.4 reported below).

- A computerized food scale system has been developed at USDA Western Human Nutrition Center to quantitate dietary intake of individuals in clinical studies. The system consists of a portable computer linked to an electronic scale and a bar code reader. The bar code reader is used to input food identification information from a food dictionary. Menu driven computer software has been developed to prompt the research subject through the procedures for recording food intake. Upon completion of data collection, stored food intake data are directly transferred to a microcomputer for editing and for conversion to nutrient intake. This system has been designed to allow for simple in-home food consumption measurement as well as rapid data processing. A prototype system has been developed and is currently being tested in the laboratory.

4. Determinants of Dietary Status Research (HNIS)

- Eight cooperative agreements were awarded to analyze CSFII-85 data to determine the personal, demographic, and household characteristics affecting dietary status measured in terms of foods and food groups and of nutrients and other food components and to determine the effect of food consumption patterns, eating patterns and health-related factors on dietary status. Research will involve 6 days' dietary data for the general and low-income populations in 1985 and 3 days' data in 1977-78. HNIS staff conducted a 3-day orientation conference for investigators and HNIS scientists are working cooperatively with investigators to assure maximum coordination among investigators and usefulness of results to USDA and HNIS. Findings from these investigations will be reported at scientific meetings, published in refereed journals and provided for use in the second report of NNMS to Congress in 1989.

5. Nutritional Status Assessment Research (ARS)

- The Western Human Nutrition Research Center at Letterman Army Institute of Research, San Francisco, CA, conducts research on improved methods for assessing human nutritional status. The Center focuses on (1) identification of factors which result in malnutrition, (2) development of reliable and efficient methods for defining nutritional status, (3) determining nutritional requirements, and (4) developing nutritional criteria and methodologies to assist in design and evaluation of nutrition action programs. Improved automated methodologies have been devised for measuring riboflavin, pyridoxine, and vitamin C status. High pressure liquid chromotography is used to measure iso-ascorbic acid levels. Rapid and accurate methods for measuring body composition also have been developed and tested.

- The Human Nutrition Research Center on Aging at Tufts University, Boston, MA, has developed an improved method of measuring vitamin K status and conducted as assessment of the nutritional status of 700 non-institutionalized and 260 institutionalized elderly in the Boston area.

- Scientists at the Children's Nutrition Research Center have devised new methods for measuring body protein and fat in infants.

- An improved method for assessing the vitamin E status, using platelets, has been developed at the Beltsville Human Nutrition Research Center.

E. Food and Nutrition Information and Education Research

This research includes studies of dietary practices, food consumption patterns and their determinants (some described in D.4 above) as well as studies of methods and strategies for informing and educating consumers and professionals who serve them about nutrition, health, and dietary practices. Research attempts to answer questions about appropriate dietary guidelines and information needed to help the public understand and meet the guidelines and techniques most appropriate for communicating this information.

1. Establishing Dietary Guidance Policy (HNIS)

- In support of the Dietary Guidelines for Americans, research efforts underway or planned include a study of non-Federal professionals' awareness and uses of the bulletin. In addition, a study of individuals' cognitive responses to the bulletin and information it contains is planned. Also, a survey underway of persons requesting free copies of the bulletin from the Consumer Information Center will provide information about reactions by and characteristics of this type user.

- A computerized system to assess the practicality of quantitative dietary recommendations of authoritative groups was developed and demonstrated at a national meeting. Certain quantitative recommendations for dietary components, established by authoritative groups such as the National Academy of Sciences (NAS), the National Cancer Institute (NCI), the National Heart, Lung and Blood Institute (NHLBI), are met by few diets reported in national surveys. The HNIS system objectively determines the dietary changes to food consumption pattern identified from national surveys required to meet all recommendations for dietary components specified.

- Meeting recommendations by the American Heart Association (AHA) in December 1986 of less than 100 mg of cholesterol per 1,000 kcal and 30 percent of kcal from fat, with or without RDA for vitamins and minerals, was shown to require dietary changes by women 19-50 years believed to be beyond changes women might make. Even more difficult to meet is the AHA guideline of 1 gm sodium per 1,000 kcal--a level achieved by no women surveyed in 1985.

2. Food and Nutrition Materials (HNIS)

- Most materials developed in 1987 interpret concepts in the Dietary Guidelines and results from USDA research on food composition, food selection, handling and storage, and food money management. Target audiences are groups of food and nutrition professionals, such as home economics teachers, Extension agents, and public health professionals who work with the general public, low-income groups, and consumers with special interest in food and nutrition.

- Two nutrition education research projects were completed and reported. One evaluated a nutrition pamphlet developed for and with the involvement of low-income, low-literacy adults. The other employed new research approaches in evaluating print materials for consumers.

- Examples of materials developed and/or released in 1987 are as follows:

  - A "Dietary Guidelines Teaching Kit" for use by home economics teachers was developed. It contains the Dietary Guidelines bulletin, "Dietary Guidelines and Your Diet", seven small bulletins--one for each of the 7 Guidelines--developed in 1986 to supplement information in the Guidelines bulletin, and a "Home Economics Teachers' Guide." A panel of teachers and an author of home economics textbooks helped prepare the Guide, which contains lesson plans with suggestions for student activities and reproducible materials for classroom use. Copies of the Kit will be made available free of charge to home economics teachers.

  - A second set of seven small bulletins to help the public put the Guidelines into practice (while planning menus, shopping for food, preparing food, eating out, making bag lunches, making quick meals, and selecting snacks) were developed and are undergoing formative evaluation.

  - A prototype microcomputer program for dietary analysis for use by consumers in Extension Service education programs was developed, presented at two professional meetings, and is being pilot-tested by Extension specialists. The user-friendly system accepts information about 1 to 3 days' food intake and presents information on the content of the diet in terms of 28 nutrients and food components in bar graphs. When perfected, the software and data bases will be made available through the National Technical Information Service.

  - The cost of food at home in food plans at four cost levels--thrifty, low-cost, moderate-cost, and liberal--was estimated and released monthly in press releases and other formats. The cost of food in the thrifty food plan for the 4-person household used by the Department in setting benefits for the Food Stamp Program increased 6.8 percent between June 1986 and June 1987.

- A study of the food sources of calcium and their costs was reported in Family Economics Review--a USDA periodical directed primarily to Extension agents. The comparative costs of meat and meat alternates as sources of protein were estimated in February and in September, and issued in press releases. Of foods studied, the most economical food sources of calcium were dry and fluid milk and calcium-fortified bread; the most economical sources of protein were eggs, beef liver, and peanut butter. Ground beef, whole chicken and turkey, and canned tuna were also economical as protein sources.

- "Cooking for People with Food Allergies," USDA Home and Garden Bulletin No. 246, presents standardized cooking procedures and recipes appropriate for people with allergic conditions.

3. Research Support Activities

The Food and Nutrition Information Center (FNIC) of the NAL supports the research activities of USDA and other scientists primarily through the provision of reference services and literature searches utilizing online bibliographic databases, such as NAL's AGRICOLA database.

F. Research on Government Policies and Socioeconomic Factors (FNS, ERS, AMS)

1. Research Initiated

o Breastfeeding Promotion Study

Federal requirements for the Supplemental Food Program for Women, Infants and Children (WIC) include provisions to encourage breastfeeding. Because little is known about the most effective methods to promote breastfeeding in the WIC population, the Food and Nutrition Service (FNS) is conducting the WIC Breastfeeding Promotion Study in FY 1987. The purpose of this study is to identify and evaluate education models for effective breastfeeding promotion. These models will be used to provide technical assistance to State and local WIC agencies in their efforts to increase the proportion of WIC women who breastfeed.

o Analysis of the Dietary Impact of FNS Programs

FNS is analyzing data from USDA's Continuing Survey of Food Intakes of Individuals to assess the impact FNS' programs have on the dietary intake and food expenditure patterns of participants. In addition to studying how program participation may directly affect dietary intake, FNS is interested in learning of any indirect effect on a non-participating household member resulting from someone in the household participating in an FNS program. Analyses also include examining participants' and non-participants' at-home and away-from-home food expenditure patterns.

o Consumer Demand for Fresh Fruits and Vegetables Studied

An award was made to the Virginia Department of Agriculture through the Federal-State Marketing Improvement Program to assess the demand for fresh fruits and vegetables by non-commercial establishments, such as public school districts and post secondary institutions. The purpose of the study is to determine the volume and kind of fresh fruits and vegetables consumed by non-commercial establishments and to identify and evaluate the factors entering into a person's decision-making process when purchasing fruits and vegetables.

- The Supplemental Food Program for Women, Infants and Children (WIC) Analytic Research Projects

This FNS research focuses on a number of specific and ad hoc policy relevant analyses using data primarily from the WIC Program and Participant Characteristics Study and the National WIC Evaluation. This research should expand present knowledge about the effectiveness of the WIC Program and provide more insight on program and participant characteristics. Examples of topics to be examined are characteristics of WIC households, food consumption patterns of WIC participants, and program factors associated with providing benefits to those most in need.

2. Other Findings

- Dietary Impacts of the School Breakfast Program

This recently released FNS study examined the intake of various nutrients, the likelihood of eating any breakfast, and the types and quantitites of foods eaten by both participants of the School Breakfast Program (SBP) and non-participants. The following are some of the major findings:

- Participation in SBP has no significant relationship with the proportion of total food energy obtained from protein, fat, or carbohydrate.
- Students 5 to 14 years of age who participate in SBP consume less cholesterol than nonparticipants.
- Calcium intake and the likelihood of meeting the RDA for calcium are, in general, positively associated with SBP participation.
- Iron intake at breakfast is negatively related to SBP participation, although the likelihood for meeting the RDA for iron does not appear to differ between participants and non-participants, except for older teenagers.
- The likelihood of eating any breakfast is not related to the SBP.
- Of the three daily meals, breakfast is the most important predictor of daily nutrient intake and whether the RDA's are met. Eating any breakfast has a significant, positive impact on the daily intake of food energy and vitamin B6, vitamin A, iron, calcium, and magnesium.

- The Sodium and Micro-nutrient Content of USDA School Lunches

This FNS study examined the effects of the National School Lunch Program (NSLP) on students' dietary intake of food energy, sodium, protein, fat and carbohydrate. Some of the major findings are:

- The lunch intake of protein by most NSLP participants is greater than that of students who eat alternative lunches.

- Female students 5 to 15 years of age experience the greatest number of significant NSLP effects on macro-nutrient intake. For both female and male students 15 to 21 years of age, there are very few differences between NSLP participants and students who eat alternative lunches for the lunch intake of food energy, sodium, protein, fat, and carbohydrate.

- There are virtually no differences in the amounts eaten at lunch by NSLP participants and non-participants, among male students of all ages.

- In no age-sex category do NSLP participants and students who eat other lunches differ in 24-hour food energy intake.

- NSLP participants have greater lunch intakes of food energy, protein, and eight micro-nutrients than do students who eat other lunches.

o The Food Choices of Low-Income Households

This FNS study involved a descriptive analysis of data from the 1977-78 Nationwide Food Consumption Survey on household food use by low-income households. Findings suggest that the quantity of food used is the primary factor differentiating households as to whether or not they achieve the Recommended Dietary Allowances (RDA). Two findings concerning Food Stamp Program (FSP) households are:

- Proportionately more FSP households than non-participating low-income households achieved 100 percent of the RDA for 11 nutrients studied.

- The food use by FSP households and low-income non-participating households was generally similar with respect to both the quantities of food used and the share of food dollars allocated to 31 food groups studied. The exceptions were red meat and eggs, which were used in larger quantities by some FSP households.

o Studies on Food Prices and Consumer Demand

ERS conducted research on the effects of advertising and promotion on the demand for cheese. During the 22-month period between September 1984 and June 1986, increased generic advertising by the National Dairy Promotion and Research Board and regional organizations of $94.7 million was found to have increased national at-home consumption of natural cheese by 12.6 million pounds and processed cheese by 38.2 million pounds.

ERS conducted research on the frequency of purchase of selected foods and changing patterns of household food expenditures. Average weekly total food expenditures rose from $21.55 per person in 1982 to $22.55 in 1984. Per person spending for food consumed at home increased from 1982-84 but not as much as per person spending on food away from home.

ERS completed a study which finds that differing supermarket prices and household purchase practices can affect real food stamp benefits. Within cities, supermarket prices typically vary by up to 7 percent, with extremes of up to 25 percent. Regional supermarket price indexes are not better than national indices, because price differences do not show regional patterns. Instead, price differences are store specific and reflect store costs, neighborhood characteristics, and company strategies. Low-income households do not necessarily pay higher prices. Actual household purchase practices do differ from government recommendations, and raise household food costs by five to eight percent, compared to the cost of the recommended diet.

III. USDA FOOD AND NUTRITION INFORMATION AND EDUCATION PROGRAMS

In 1987 the eight or more separate USDA agencies largely responsible for food and nutrition information and education continued programs to meet their clients' needs. Improved communication and cooperation among agencies on information and education projects was promoted especially by the Subcommittee for Human Nutrition of the Committee on Research and Education and by the Assistant Secretaries for Food and Consumer Services and for Science and Education.

A. Current Program Parameters

1. Ongoing Food and Nutrition Information and Education Activities

USDA agencies and their primary food and nutrition information and education responsibilities are listed below.

- Food, nutrition and health programs continue to be a major program emphasis within Cooperative Extension Service. Each year, approximately 10-12 million people participated in this educational program. Additional people were reached through mass media efforts. In addition, approximately one third of all 4-H members have food and nutrition projects. All 50 states and 5 territories support major programs in food, nutrition and health. In addition, every county home economics program includes a food, nutrition and health component.

  People of all age groups and income levels participate in Extension food, nutrition and health programs. The Dietary Guidelines in conjunction with research based information serve as the bases for developing program content. Programs are designed to assist consumers in making sound decisions that can positively affect their quality of life. Major program emphases are nutrient needs throughout the life cycle, the relationship of diet and fitness to overall health and well-being, evaluation of nutrition information, management of food resources, and understanding the factors that affect food quality.

- The Extension Service (ES) operates Food and Nutrition Education Programs in partnership with the Cooperative Extension System to disseminate knowledge and applied research directly to the general public. ES also operates the Expanded Food and Nutrition Education Program (EFNEP), a mandated program for low income families and youth.

- The Human Nutrition Information Service (HNIS) coordinates Federal dietary guidance policy, develops research-based dietary guidance materials for the general public, and reports results from its research in food composition, food consumption, and nutrition education to professionals.

- The National Agricultural Library (NAL), through its Food and Nutrition Information Center (FNIC), collects and disseminates information on a wide range of nutrition topics and accumulates and loans nutrition education materials to educators.
- The Agricultural Research Service (ARS) and the Cooperative State Research Service (CSRS) report results from their programs of food and nutrition research usually to professional audiences.
- The Food Safety and Inspection Service (FSIS) is responsible for the safety, wholesomeness and accurate labeling of meat and poultry products and for informing the public on safe handling of these foods.
- The Agricultural Marketing Service (AMS) is responsible for the grading of foods and for the accuracy of promotional materials of some commodity groups.
- The Food and Nutrition Service (FNS) supports the nutrition education components of food assistance programs they administer--Child Nutrition, WIC, Food Stamp.
- Office of Governmental and Public Affairs (OGPA) provides review and coordination of all food and nutrition information disseminated by USDA.

2. New Initiatives

o Improving Nutrition, Diet, and Health Extension Thrust

"Improving Nutrition, Diet, and Health" has been selected as one of eight major initiatives of the Extension Service. The goal is to improve nutritional and health status of the population through nutrition education, resulting in the adoption of recommended dietary practices.

The development and implementation of a priority initiative will strengthen the coordination and focus the resources of the State Cooperative Extension in this area. Two critical issues have been identified for this initiative. These are: (1) Dietary practices relating to lifestyle factors and health problems such as infant mortality, low birth weights, obesity, chronic diseases and nutrition misinformation, inadequacies and abuses, and (2) Confidence in the safety, quality, and composition of the food supply. The two goals of this issue are: Improve the ability of consumers to make informed choices related to food safety, quality, and composition; and increase knowledge and improve understanding about the food system including its risks and benefits among consumers, policy makers, the media, and food producers, processors, and handlers while the system fulfills the consumers needs and perceptions. Extension centers of excellence are envisioned as a means of developing this initiative within available resources and personnel.

o Cross-Cultural Counseling Project

The Cross-Cultural Counseling Project began in 1986 to provide technical assistance to staff of the WIC Program and the Commodity Supplemental Feeding (CSF) Program in counseling a wide range of racial/ethnic groups. The project goal is to enhance the cross-cultural counseling skills of nutrition counselors in the WIC and CSF programs in order to increase participant acceptability of the information presented. A technical assistance guide was developed jointly by the Food and Nutrition Service (FNS), USDA; and DHHS in 1986. In 1987 a video tape was developed by FNS to assist program staff when presenting the technical material in a workshop setting.

o Food Distribution Program on Indian Reservations

In 1985-1986, an FNS task force reviewed the Food Distribution Program on Indian Reservations (FDPIR) regulations and made recommendations for improving the food package and expanding nutrition education efforts.

In 1987, in response to task force recommendations, FNS decreased levels of fat and sugar; added several new foods to reflect nutritional needs and food preferences; increased the quantitites of several popular foods; and deleted several unpopular foods. FNS also is working with the Indian Health Service (IHS), the Extension Service, and the USDA Food and Nutrition Information Center (FNIC) to develop a set of bibliographies on information and resource materials of the health and culture of American Indians. The Extension Service cooperated with FNS in obtaining from State Cooperative Extension Service nutrition education materials used in delivering the program to Alaskan Natives and American Indians. The information contributed to the bibliography is utilized by mainly Extension professionals and paraprofessionals in teaching in the Expanded Food and Nutrition Education Program.

Additionally, FNS has begun several initiatives to address the recommendations for the nutrition education component. These include:

- Expanding FNIC service to FDPIR staff.
- Identifying nutrition education contacts in the Indian Tribal Organizations and State agencies who will help publicize FNIC services as well as receive nutrition education materials prepared.
- Working cooperatively with the Indian Health Service (IHS) and FNIC to develop an FDPIR nutrition education resource guide.

o Nutrition Education Resource Guide

FNIC has also initiated an update to the "Promoting Nutrition through Education: A Resource Guide to the Nutrition Education and Training Program (NET)." This update included food service training and nutrition education resources developed with NET support since 1984.

o Conference on Nutrition and Fitness Planned

A task group of the Subcommittee on Human Nutrition, chaired by Bonnie Tanner, ES, is planning a national conference on nutrition and fitness to be held in Washington, D.C. in March 1988. This conference is being coordinated with the USDA Interagency Committee on Food and Fitness and will be cosponsored by the President's Council on Physical Fitness and Sports.

o USDA Food and Fitness Program

The USDA Food and Fitness program is designed to increase public awareness of the abundance and variety of foods provided by American agriculture, and the relationship of diet and exercise to good health. The program aims to encourage all Americans to use this bounty of food and physical fitness opportunities to their own advantage and health--every day. Twenty-two USDA agencies work together in planning and implementing this program at the national level and the Extension System coordinates and implements the program at the State and local level. All States and territories have identified State Food and Fitness Coordinators. Approximately 30 million adults and youth have been reached nationwide.

- Red Meat Project

USDA Extension Service has recently funded a project that will introduce a new process for program development of a consumer education program. The topic for this pilot project is red meat. The aspects that are unique are that the development process will include a multidisciplinary team of Meat Science and Food and Nutrition Extension Specialists from three different States--Florida, Kansas, and Texas. In addition, an advisory group of red meat industry representatives and end-users organizations will be formed to provide input and to react to the products that are developed. The anticipated benefits of this type of approach will be a more uniform approach to the controversial aspects of red meat, and the development of educational resources that have a national identity. It is anticipated that this will provide consumers with a much clearer description of red meat's role in a varied, balanced diet.

- Revision of USDA Publications of Food Safety/Preservation

ES-USDA has been working for several years with the Extension Center of Excellence for Food Safety and Preservation at Penn State University to develop the necessary data for revising four of the very popular USDA publications on food preservation. The four publications cover the canning of fruits and vegetables; canning of meats, poultry and fish; making jams and jellies; and making pickles. These publications stress the safety aspects of home food preservation which is needed to counter the vast amount of misinformation and unsafe practices which continue to be handed down from generation to generation. The publication date is expected to be late winter 1988.

Education materials in the form of newsletters, fact sheets, pamphlets, videotapes, slide/cassette sets and posters continue to be used in all states to educate consumers and institutional food handlers about safe food handling practices. The information relates ways to avoid contamination and cross-contamination with bacteria that cause foodborne disease. Dangerous pathogens such as Salmonella can exist on foods but not be harmful once consumers practice proper cooking procedures and sanitation practices. Quality and safety attributes are closely related and are generally discussed in the same publication. Extension publications for consumers are oriented to the production of not only nutritious, tasteful, and aesthetically appealing--but also safe foods.

B. USDA's Responsibility to Assure That the Federal Government "Speaks With One Voice" When Issuing Dietary Guidance

Promotion of the Guidelines. HNIS continues to offer free copies of "Nutrition and Your Health: Dietary Guidelines for Americans," second edition, published by USDA and DHHS in 1985, through the Consumer Information Center (CIC). Over 750,000 copies were distributed in 1987. Also offered are camera-ready copies of the bulletins for reproduction by others. ES and HNIS are conducting a study of users and uses of the bulletin and concepts it presents. Also CIC is surveying people who request single and bulk copies of the bulletin to provide information about these audiences and their reactions to the bulletin.

Keeping Guidelines current. The formation of a new Federal Dietary Guidelines Advisory Committee is being planned by HNIS. The Committee will review recent scientific evidence on diet/health relationships and make recommendations to the Secretaries of USDA and DHHS for changes they deem appropriate to the second edition of the Dietary Guidelines. These recommendations will be used by the two Departments to prepare the third edition of the Guidelines to be issued in the early 1990's.

Supplemental information. Additional HNIS materials devoted to helping put the Guidelines into practice include a Home Economics Teachers' Guide that promotes the use of the Guidelines with junior and senior high school home economics students. Also, a second set of seven "minibulletins" on menu planning, food shopping, food preparation, eating out, bag lunches, quick meals, and snacks is undergoing formative evaluation.

Uniformity within USDA. The Dietary Guidance Working Group of the Subcommittee for Human Nutrition initiated in 1986 is now fully functional. Two new members have been appointed to the Group--a liaison from the DHHS and a representative from USDA's National Agricultural Library. This is in addition to representatives from the eight USDA agencies--AMS, ARS, ERS, ES, FNS, FSIS, HNIS, and OGPA. This group is responsible for reviewing all USDA publications and materials that contain dietary guidance information to help ensure that they accurately reflect USDA's food and nutrition policy (as presented in the Dietary Guidelines for Americans and the Secretary's Statement of USDA's Food and Nutrition Policy), are supported by research-based knowledge, are objective in presentation, and are supportive across agencies of USDA.

Uniformity among Departments. The Department continues to work with other agencies, especially the DHHS and the Department of Defense (DOD), in promoting uniformity of dietary guidance messages. For example, USDA is represented on a newly formed DHHS dietary guidance coordinating committee and on the Coordinating Committee for the National Cholesterol Education Program sponsored by the National Heart, Lung and Blood Institute. Also, several USDA nutritionists participated in DOD's national conference on diet and fitness.

Coordination with private sectors. USDA brought to the attention of the American Heart Association (AHA) the extreme dietary change required to bring average diets into conformity with the guidelines for healthy adults proposed by AHA in December 1986. Discussions with the American Dietetic Association have resulted in the extensive use of the Dietary Guidelines and Your Diet (minibulletins) and potential cooperation in the future on dietary guideline related issues. USDA has interpreted its research and dietary guidance policies for numerous commodity and trade associations who strive to develop products that meet consumer demands which are increasingly related to nutritional health issues. The American Red Cross 12-hour nutrition course developed cooperatively with HNIS and ES, continues to be used in Red Cross Chapters nationwide to interpret the Dietary Guideline concepts in practical, interesting ways shown to be successful in improving knowledge and food selection behavior through extensive evaluation. A Nutrition Education Task Force, under the direction of FDA, composed of government and industry representatives continues to meet quarterly.

Coordination with State and local programs. Although some Federal projects and publications have consumers as their audiences, most nutrition education activities are originated in or relayed through State and local programs. The first educational objective of the Extension Service's new national initiative for improving of nutrition, diet, and health is that adults and youth become aware of the practices recommended in the Dietary Guidelines for Americans. Nutrition messages in materials prepared for use in local Food Stamp Program centers are based on the Dietary Guidelines. HNIS' Home Economics Teacher's Guide will help promote the Dietary Guidelines through the school system.

Extension Service Nutrition Education. Food, nutrition and health programs continue to be a major program emphasis within Cooperative Extension Service. Each year, approximately 10-12 million people participated in this educational program. Additional people were reached through mass media efforts. In addition, approximately one third of all 4-H members have food and nutrition projects. All 50 states and 5 territories support major programs in food, nutrition and health. In addition, every county home economics program includes a food, nutrition and health component.

People of all age groups and income levels participate in Extension food, nutrition and health programs. The Dietary Guidelines in conjunction with research based information serve as the bases for developing program content. Programs are designed to assist consumers in making sound decisions that can positively affect their quality of life. Major program emphases are nutrient needs throughout the life cycle, the relationship of diet and fitness to overall health and well-being, evaluation of nutrition information, management of food resources, and understanding the factors that affect food quality.

C. Improved Linkages Between Research and Information and Education Activities

Various USDA agencies conduct research in a broad range of food, nutrition, and health topics basic to the targeting and the establishment of the content of nutrition education projects and programs. Customary reporting of research results continued through professional journals, press releases, papers, and exhibits at meetings of professional societies and other groups. Stronger research/educational linkages are recognized as desirable and some mechanisms were established. Examples are as follows:

- The Interagency Committee on Human Nutrition Research (ICHNR) has agreed that the Human Nutrition Research Information Management System (HNRIMS) data base, with information on federally-funded current research in some 34 defined areas of human nutrition, and the Current Research Information

System (CRIS) with information on research from the Cooperative State Research Service should be combined and made available for public use through DIALOG. This makes available to educators and others research plans and results on a most timely basis. Agencies contributing to the HNRIMS are the Departments of Agriculture (USDA), Commerce (DOC), Defense (DOD), and Health and Human Services (DHHS), the Veterans' Administration (VA), the Agency for International Development (AID), the National Aeronautics and Space Administration (NASA), and the National Science Foundation (NSF).

o Bibliographies of print and audiovisual resources for three user levels (consumer, educator, health professional) are now available on 27 food and nutrition topics through the National Agricultural Library's Food and Nutrition Information Center.

o A Memorandum of Understanding between the Human Nutrition Information Service and the Extension Service clarifies the intention of the two agencies to coordinate their respective and complementary research and education programs as a means of achieving their common goal--to enable individuals to make informed decisions about food and diet as a means of improving their health and well-being.

Improved coordination will enhance the integration of research-based nutrition messages into public education and facilitate feedback from the public on information needs that can be met through future research. A CES panel is being formed to advise HNIS/ES staff on research and information needs and to evaluate existing and future efforts.

o A series of meetings of ES, FNS, and HNIS and the Department of Education staff have focused on research-based nutrition education messages and techniques for reaching low-income, low-literacy adults. The main objective of the group is to identify mechanisms and means for communicating concepts of the Dietary Guidelines for Americans to low-literacy adults.

o HNIS interpreted its food consumption behavioral research in regional and national workshops for public health nutritionists and WIC program educators. Recent survey results on food and nutrient intakes and dietary practices are used to target populations in need of guidance and to identify dietary problems that need to be remedied.

o The 1987 Journalists' Conferences, jointly sponsored by USDA and FDA, which interpreted research and regulations on food and nutrition for journalists were convened in Washington, DC; Chicago, IL; and Denver, CO.

D. Coordinated Delivery of Message

Numerous activities in 1987 have been coordinated among USDA agencies at the Federal level to ensure conformity of message and prudent use of resources.

o The second set of Dietary Guidelines "minibulletins" are being developed by HNIS with assistance from ES and other USDA and DHHS nutritionists and will be "delivered" through ES and other public and private education programs.

- Extension agents are also helping to promote the HNIS-developed Home Economics Teachers Guide in their communities. The Guide suggests lesson plans and activities for use in interpreting the Dietary Guidelines and the first set of "minibulletins" for use by junior and senior high school home economics students.

- The Food and Nutrition Service (FNS) Make Your Food Dollars Count nutrition education initiative for the Food Stamp Program (FSP) has been in existence since 1983. The project was designed to provide nutrition information to low-income households, particularly food stamp households, to help them buy and prepare nutritious foods that are low in cost. The Cooperative Extension Service assisted with the coordination, provided leadership in teaching, and also assisted with recruiting community leaders to attend the workshops.

  In four years the project has grown from a series of workshops to a coordinated national multi-media nutrition education project. Seven regional workshops have been conducted for nutrition professionals and community leaders to share meal plans, food buying tips, and instructions on counseling low-income individuals. Each regional workshop has prompted additional State and local workshops. The Cooperative Extension Service assisted with the coordination, provided leadership in teaching and also assists with recruiting community leaders to attend the workshops.

  Also, FNS has developed a variety of print and audiovisual materials to teach shopping and nutrition tips to FSP participants. The materials include a series of pamphlets, two colorful posters, newspaper reproducibles of the pamphlets, a slide-tape show, a project guide, and brief messages on the outside back covers of the food stamp coupon booklets. The pamphlets focus on various topics, for example: how to buy, store and prepare fruits, vegetables and legumes, and how to use less sugar, fat and sodium in the diet. All materials developed thus far are designed to be easily read and understood by adults with limited formal education.

  Currently, FNS is working on an initiative to promote the Make Your Food Dollars Count materials and information via public service announcements.

- Through a reimbursable agreement with FNS, FNIC continues to lend materials and technical support to FNS-administered programs and personnel, particularly school food service managers, educators, day care providers, and WIC nutritionists among others. During FY 1987, this agreement also supported the extension of special outreach, lending and reference services to nutrition educators and others who work with the Food Distribution Program on Indian Reservations.

  PATHFINDERS continue to be revised and updated, and the following new titles have been completed:

  - Commonsense Nutrition
  - Osteoporosis
  - Salmonella and Poultry
  - Children's Literature on Food & Nutrition
  - Irradiated Fruits

The Center continues to distribute single copies of the USDA/DHHS Dietary Guidelines as well as USDA's Dietary Guideline Bulletins in response to requests for general information about nutrition from consumers and educators.

- In a joint effort of the public and private sectors, FNIC collaborated with the Department of Health and Human Services and the March of Dimes Birth Defects Foundation to produce Nutrition & Adolescent Pregnancy: A Selected Annotated Bibliography. It is intended to serve as a source of technical assistance for nurses, nutritionists, physicians, educators, social workers, and other personnel concerned with improving the health of teenage mothers and their babies.

  FNIC database searches are sometimes published in the form of Quick Bibliographies, which are designed to serve as research aids for recent investigations on a particular topic. Recent titles include:

  - Diet, Race, and Ethnicity in the U.S.: Research and Reference Materials (1979-1986)
  - Iron and Human Nutrition: Research and Reference Materials (1982-1986)
  - Infant Nutrition: Research and Reference Materials (1984-1986)
  - Nutrition Education Materials: Preschool through Grade 6 (1979-1986)
  - Nutrition Education Materials: Grades 7-12 (1979-1986)

- The Electronic Food and Nutrition Information Service, initiated in 1986 as part of USDA ONLINE on the Dialcom computer system, has also been added to the Department's EDI system. The EDI system is USDA's main information service for delivery of current information under a contract with Martin Marietta Data System. Inclusion on the EDI system increases the audience of the information through prime news users such as AgriData Resources, Inc., Agnet, Knight-Ridder Financial News, Pioneer Hi-Bred International, Inc. and other large multipliers of information.

- Extension's Expanded Food and Nutrition Education Program (EFNEP). This program, which began in 1968, continues to be a very effective program for the target audience of low-income families with small children to acquire the knowledge, skills, attitudes, and changed behavior necessary to improve their diet utilizing their meager resources well. Through an innovative approaches program, ways have been found to be more cost effective in program delivery while maintaining effective education through the paraprofessional system of educators. The major audience for this program are the Food Stamp recipients. ES and FNS are working to improve coordination and delivery of services.

IV. FUNDING LEVELS (1983-1988)

The expenditures for human nutrition research and human nutrition education and information by the several agencies in USDA for fiscal years 1983 through 1986 are summarized in Table 2. The estimated expenditures for FY 1987 and the Congressional appropriation for FY 1988 are also included. The total amount of human nutrition research support has increased from $47.8 million in fiscal

Table 2

U.S. DEPARTMENT OF AGRICULTURE
HUMAN NUTRITION RESEARCH, EDUCATION AND INFORMATION SUPPORT (FY 83-88)

HUMAN NUTRITION RESEARCH
($ in Millions)

	FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
ARS	31.7	34.3	36.9	37.8	40.6	44.3
CSRS	7.8	7.7	7.3	7.4	7.5	7.7
HNIS	6.7	5.3	6.0	12.8	6.1	7.7
ERS	0.9	0.7	0.7	1.1	1.2	1.4
FNS	0.7	5.4	1.4	1.5	0.5	0.4
TOTAL	47.8	53.4	52.3	60.7	55.9	61.5
Human Nutrition Education and Information						
ES	76.1	76.6	77.0	73.5	73.5	75.0
HNIS	1.0	0.7	0.7	1.2	0.7	0.9
FNS	42.0	50.5	55.0	57.6	60.4	61.0
FSIS	0.4	0.3	0.5	0.4	0.13	0.12
NAL	0.4	0.4	0.4	0.5	0.4	0.5
TOTAL	120.0	128.5	133.6	133.2	135.1	137.5
TOTAL RESEARCH, EDUCATION AND INFORMATION	167.8	181.9	185.9	193.9	191.0	199.0

Table 3

USDA NUTRITION RESEARCH PROGRAM SUPPORT (FY 83-88)
($ in Millions)

	FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
1. Nutrient Requirements/ Health Maintenance						
CSRS	2.7	3.3	3.6	3.7	4.8	5.0
ARS	26.4	27.3	26.3	27.5	29.9	31.0
Total	29.1	30.6	29.9	31.2	34.7	36.0
2. Nutritional Status/ Food Intake						
CSRS	2.8	2.8	2.3	2.4	1.4	1.4
ARS	0.7	0.6	2.3	3.1	3.9	3.9
HNIS	3.5	2.6	3.2	9.9	3.2	4.8
Total	7.0	6.0	7.8	15.4	8.5	10.1
3. Use of Food/Food Choices						
CSRS	0.4	0.3	0.2	0.3	0.3	0.3
HNIS	1.7	1.1	1.1	1.1	1.1	1.1
ERS	.6	0.4	0.4	0.8	0.9	0.9
Total	2.7	1.8	1.7	2.2	2.3	2.3
4. Nutrient Composition/ Bioavailability						
CSRS	1.8	1.3	1.6	1.0	1.0	1.0
ARS	4.7	6.5	8.3	7.2	6.8	9.4
HNIS	1.5	1.6	1.7	1.8	1.8	1.8
Total	8.0	9.4	11.6	10.0	9.6	12.2
5. Nutritional Impacts of Programs						
CSRS	0.1	--	--	--	--	--
ERS	0.3	0.3	0.3	0.3	0.3	0.5
FNS	0.7	5.4	1.4	1.5	0.5	0.4
Total	1.1	5.7	1.7	1.8	0.8	0.9
TOTALS						
CSRS	7.8	7.7	7.3	7.4	7.5	7.7
ARS	31.7	34.3	36.9	37.8	40.6	44.3
HNIS	6.7	5.3	6.0	12.8	6.1	7.7
ERS	0.9	0.7	0.7	1.1	1.2	1.4
FNS	0.7	5.4	1.4	1.5	0.5	0.4
USDA Total Nutrition Research	47.8	53.4	52.3	60.7	55.9	61.5

Table 4

USDA FOOD AND NUTRITION EDUCATION AND INFORMATION SUPPORT (FY 83-88)
($ in Millions)

	FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
Extension Service1/						
Extension (Formula est.)	15.8	16.2	16.7	15.9	15.9	16.4
Expanded Food and Nutrition Education Program (EFNEP)	60.4	60.4	60.3	57.6	57.6	58.6
Total	76.1	76.6	77.0	73.5	73.5	75.0
National Agricultural Library Food, Nutrition and Human Ecology Staff	0.4	0.4	0.4	0.5	0.4	0.5
Human Nutrition Information Service Nutrition Education Division	1.0	0.7	0.7	1.2	0.7	0.9
Food and Nutrition Service1/						
Nutrition Education & Training Program (NET)	5.0	5.0	5.0	5.0	5.0	1.0
Special Supplemental Food Program for Women, Infants and Children (WIC)2/	37.0	45.5	50.0	52.6	55.4	60.0
Total	42.0	50.5	55.0	57.6	60.4	61.0
Food Safety and Inspection Service						
Nutrition Labeling	0.08	0.1	0.1	0.1	0.1	0.1
Nutrition and Sodium Information	0.06	0.1	0.1	0.1	0.02	0.01
Sodium Monitoring Program	0.28	0.1	0.3	0.2	0.01	0.01
Total	0.42	0.3	0.5	0.4	0.13	0.12
USDA Total Nutrition Education and Information	120.0	128.5	133.6	133.2	135.1	137.5

1/ Most funds are distributed to and managed by State agencies.

2/ Estimate of State administrative funds allocated for nutrition education.

Table 5

AGRICULTURAL RESEARCH SERVICE
HUMAN NUTRITION RESEARCH SUPPORT (FY 1983-88)

Estimated Funds (In millions of dollars)

		FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
BHNRC, Beltville, MD	Gross	7.92	7.97	8.00	7.91	8.34	8.42
	Net	6.98	6.98	7.30	7.02	7.41	7.35
GFHNRC, Grand Forks, ND	Gross	5.41	5.72	6.19	6.36	6.66	7.11
	Net	5.06	5.33	5.57	5.64	5.92	6.32
HNCA, Boston, MA	Gross	7.19	9.59	11.35	11.75	12.76	13.68
	Net	6.84	9.12	10.79	11.16	12.12	12.99
CNRC, Houston, TX	Gross	2.95	3.27	3.59	4.43	5.43	7.65
	Net	2.69	2.96	3.23	3.93	4.88	6.99
WHNRC, San Francisco, CA	Gross	3.48	3.81	3.79	3.66	4.23	4.49
	Net	3.05	3.33	3.42	3.25	3.76	3.95
TOTAL, HN Centers	Gross	26.95	30.36	32.93	34.12	37.43	41.35
	Net	24.61	27.70	30.31	31.01	34.09	37.59
Other ARS HN Research	Gross	3.93	3.97	3.88	3.65	3.18	3.01
	Net	3.25	3.27	3.49	3.24	2.86	2.65
TOTAL, Human Nutrition	Gross	30.88	34.33	36.81	37.76	40.61	44.36
	Net	27.86	30.97	33.80	34.24	36.95	40.25

Table 6

AGRICULTURAL RESEARCH SERVICE

OTHER ARS HUMAN NUTRITION RESEARCH SUPPORT (FY 83-88)*
(In thousands of dollars)

		FY 1983 actual	FY 1984 actual	FY 1985 actual	FY 1986 actual	FY 1987 actual	FY 1988 estimate
Beltsville, MD	Gross	187.0	187.0	--	--	--	128.7
	Net	155.0	155.0	--	--	--	111.8
Ithaca, NY	Gross	295.5	305.0	551.5	601.3	750.9	765.0
	Net	242.1	246.7	496.6	533.5	675.9	676.0
Wyndmoor, PA	Gross	573.7	580.2	700.5	667.1	303.1	--
	Net	468.6	471.2	630.6	591.8	272.9	--
Peoria, IL	Gross	1,178.5	1,184.4	1,023.8	985.5	982.4	1017.5
	Net	983.7	985.3	921.7	874.5	884.3	898.8
Albany, CA	Gross	1,400.4	1,412.2	1,007.9	959.2	712.7	653.8
	Net	1,157.1	1,161.3	907.5	851.0	641.5	576.3
Athens, GA	Gross	291.4	302.2	149.0	--	--	--
	Net	244.6	249.8	134.1	--	--	--
Hyattsville, MD	Gross	--	--	449.0	433.5	432.7	443.1
	Net	--	--	404.2	384.6	389.5	391.0
	Gross	3,926.5	3,971.0	3,881.7	3,646.6	3,181.8	3,008.1
	Net	3,251.1	3,269.3	3,494.7	3,235.6	2,864.1	2,653.9

* Excludes Human Nutrition Centers

year 1983 to $61.5 million in fiscal year 1988, an increase of 28.7 percent. During the same period, support for human nutrition education and information has increased from $120.0 to $137.5 million, an increase of 14.6 percent. The total support for human nutrition in the Congressional appropriation for FY 1988 is $199.0 million or 18.6 percent more than was expended in FY 1983.

Table 3 shows the amount of human nutrition research support within the Department for this period by subject area categories and agency. Half of the human nutrition research effort is focused on determining nutrient requirements/health maintenance at all stages of life. One-fourth of the effort relates to the development of methods for measurement of nutritional status and collection of food consumption information. Approximately 1/6 of the funds are used to measure the content and bioavailability of nutrients in foods. The funds shown in the table do not include funds provided by the States or other sources and used in conjunction with those funds provided by the Cooperative State Research Service (CSRS).

Table 4 presents a breakdown of human nutrition education and information expenditures and budgets by subject category for the fiscal years 1983 through 1988.

A summary of actual expenditures, estimated support and the Congressional appropriation is given in Table 5 for the five Human Nutrition Research Centers and other Laboratories or Centers of the Agricultural Research Service (ARS) for fiscal year 1983 through fiscal year 1988. The net figure refers to funds to the location, while the gross amount includes overhead costs.

The Center at Tufts University in Boston is operated by ARS as a government-owned, contract-operated (GOCO) facility. The Center at Baylor College of Medicine in Houston is operated by ARS through a cooperative agreement.

Human nutrition research support at ARS Regional Research Centers and other Laboratories is shown in Table 6. These studies help to assure that problems and opportunities in human nutrition are considered in research directly related to the quality of the food supply.

V. COORDINATION AND ADVISORY MECHANISMS

A. Coordination Within the Federal Sector

1. Interagency Committee on Human Nutrition Research

Nutrition research continued to be coordinated at the Federal level through the Interagency Committee on Human Nutrition Research (ICHNR) with participation by USDA, DOC, DOD, DHHS, AID, VA, NASA, and NSF. Regular meetings in 1987 cochaired by the Assistant Secretary for Science and Education (USDA) and the Assistant Secretary for Health (DHHS) fostered communication among research agencies and sponsored the following activities:

- The Third Conference for Federally Supported Human Nutrition Research Units and Centers. This conference, held February 24-25, 1987, addressed two topics of special interest to Federal nutrition researchers--Human Nutrition Requirements and Dietary Intake Methodologies. Twenty-one of the thirty-nine papers presented were given by USDA scientists. The meeting included researchers from Clinical Nutrition Research Units supported by NIH, several Veteran Administration laboratories, National Aeronautics and Space Agency, Department of Defense, Agency for International Development and the Food and Drug Administration. This Conference, held at 2-year intervals is considered to be a most valuable activity sponsored by the Interagency Committee on Human Nutrition Research, as a forum for information exchange and stimulus for research collaboration. A summary of the conference is being prepared for publication.

- Subcommittee on Technology, Nutrition, and Food Production. A standing committee, chaired by Orville Bentley, was formed to monitor the scientific, regulatory and marketing developments with implications for the food supply. Agencies represented include USDA, FDA, DOC, and AID.

- Subcommittee on Research and the RDA's. This task-oriented subcommittee has the responsibility for identifying scientific issues that are relevant for the setting of dietary allowances. Agencies represented include NIH, USDA/ARS, DOD and VA.

- Subcommittee on Nutrition Monitoring. This subcommittee was formed to provide interagency coordination for the NNMS with cochairs from the Offices of the Assistant Secretaries for Food and Consumer Services (USDA) and for Health (DHHS). Early tasks of the Subcommittee are to define terms and to list and prioritize research needs, especially in the area of nutrition monitoring methodologies.

2. USDA/DHHS Cooperation on Nutrition Monitoring

Other NNMS efforts have involved extensive coordination between USDA and DHHS.

- Joint Operational Plan for the National Nutrition Monitoring System

This plan was prepared under direction of the Assistant Secretaries for Health (DHHS) and for Food and Consumer Services (USDA) and sent to Congress in August 1987. The Operational Plan defines goals and plans for NNMS for the period of 1987-1996 and follows the period covered in the Joint Implementation Plan sent to Congress in 1981.

- Report to Congress from the National Nutrition Monitoring System

This report, to be submitted in 1989, has been initiated. The scientific basis for the report, for which the nature of the content was defined by a USDA/DHHS Steering Committee, will be prepared under contract by the Life Sciences Research Office of the Federation of American Societies of Experimental Biology.

- HNIS and NCHS Cooperation

The HNIS/USDA and the National Center for Health Statistics (NCHS), DHHS, are continuing their joint planning and collaboration in conducting the USDA Food Consumption Survey and the NCHS National Health and Nutrition Examination Survey, the core surveys of the National Nutrition Monitoring System. This collaboration as well as the joint publication of the Dietary Guidelines for Americans are coordinated by the Assistant Secretaries for Health in DHHS and for Food and Consumer Services in USDA.

3. Other Federal Sector Coordination

- The USDA/DHHS Nutrition Education Committee for Maternal and Child Nutrition Publications

The USDA/DHHS Nutrition Education Committee for Maternal and Child Nutrition Publications was established in November 1980 by the Assistant Secretary for Health, DHHS and the Assistant Secretary for Food and Consumer Services, USDA. The purpose of the Committee is to coordinate efforts on producing nutrition education materials related to pregnancy and infant care to be used by program staff serving mothers and children. There is a USDA and DHHS coordinator for this joint effort. A staff member of the Nutrition and Technical Services Division, Food and Nutrition Service, serves as the USDA coordinator. The Committee meets three times per year and submits an annual report of coordinated efforts and joint projects. The Committee has stimulated greater collaboration on projects and wider dissemination of information in the area of maternal and child nutrition.

- NAL and NLM Develop Coordinated Program

NAL and the National Library of Medicine (NLM) have reviewed their collection development policies in human nutrition and related subjects, and have issued a joint statement which summarizes their respective collection responsibilities. NAL, NLM, and the Library of Congress cooperate to ensure that significant literature in human nutrition is collected, retained, and preserved at the national level and to make this literature accessible to the wide variety of researchers and practitioners throughout the U.S.

FNIC has continued its coordination efforts by maintaining national networks for the dissemination of food and nutrition information. State school food service personnel, WIC nutrition educators, NET Program Coordinators, and school nurses currently participate in these networks.

- Development of Reports on Cholesterol and on Calcium for the Congress

During FY 1987, scientists in USDA and the National Institute of Diabetes and Digestive and Kidney Diseases and the National Heart, Lung, and Blood Institute completed the preparation, review, and submission of two reports to Congress in accordance with the Food Security Act of 1985, P.L. 99-198, Subtitle B, Section 1453. These were: "The Relationship Between Dietary Cholesterol and Blood Cholesterol and Human Health and Nutrition" and "Assessment of the Existing Scientific Literature and Research on Dietary Calcium and Its Importance in Human Health and Nutrition."

o ARS Nutrient Composition Laboratory and HNIS Nutrient Data Research

There is very close interaction between the ARS Food Composition Laboratory and the HNIS Nutrient Data Research Branch in planning and conducting food composition studies and in compiling and documenting results. The ARS Human Nutrition Research Center at Beltsville, Maryland, and the National Heart, Lung and Blood Institute of NIH have a long history of collaboration in food composition research directed primarily toward developing accurate, precise methods for determination of lipids in foods, particularly fatty acids and cholesterol. The Nutrient Composition Laboratory also has conducted research supported by the National Cancer Institute to develop methods for measuring carotenoids in foods. In addition, the Lipid Nutrition, Nutrient Composition, and Vitamin and Mineral Nutrition Laboratories of the Center have collaborated with the National Cancer Institute in studies on dietary fat and steroid metabolism in relation to cancer risk in healthy adults. Collaborative studies also are underway with the National Bureau of Standards in the development of appropriate food/biological reference materials characterized for nutrient content.

B. Coordination Within USDA

o Subcommittee for Human Nutrition

The Subcommittee for Human Nutrition of the Department's Research and Education Committee continued to serve as the focal point for coordination of human nutrition activities through regular monthly meetings of representatives from those agencies involved. In addition to assuring the exchange of current information between agencies and offices involved, the Subcommittee serves as the Department's mechanism for exploring and making recommendations on human nutrition related policy issues. The Subcommittee has developed a food and nutrition policy statement, a directory of USDA activities related to human nutrition, and a USDA Comprehensive Plan for a National Food and Nutrition Research and Education Program, a report sent to Congress in 1986. This report was prepared through the Subcommittee. The Subcommittee has established a Dietary Guidance Working Group to ensure that USDA informational materials conform to the Dietary Guidelines for Americans.

o Dietary Guidance Working Group

The Dietary Guidance Working Group, formed under the Subcommittee for Human Nutrition in 1986, is now fully functional. It has reviewed numerous prospectuses and publication drafts presenting dietary guidance. The review process is thorough and timely. It has demonstrated the value of such a group for ensuring that guidance conforms to the Dietary Guidelines and is consistent and supportive across USDA agencies and the Federal government. The group has also served as a means of communication among nutrition education specialists in the USDA agencies that provide guidance to their respective clientele.

o FNS and HNIS Cooperate on Standards

The FNS and HNIS cooperate in the development of certain food assistance program standards, such as the thrifty food plan for establishing benefits in the Food Stamp Program and meal patterns for measuring compliance in the

National School Lunch Program. HNIS-generated data bases on food composition and food consumption and prices are used in developing the standards.

o HNIS and ERS Cooperate on Food Supply Data

The ERS and HNIS cooperate in estimating and publishing information on trends in the nutrient content of U.S. food supplies.

o Commodity Programs Consider Dietary Guidelines

The Agricultural Marketing Service has engaged in major commodity initiatives with the Food and Nutrition Service and the Agricultural Stabilization and Conservation Service to be more responsive to the needs of participants in school feeding programs. The initiatives focus on kinds and forms of commodities purchased for distribution, and consideration is given to the USDA/DHHS Dietary Guidelines.

o USDA Agency Publications Used by Extension System

As one can see in Table 7, many of the nutrition and food safety publications produced in USDA by other agencies are being utilized and distributed by the Extension System. In many cases we only have a count of the initial distribution or of a cost-share order. In most cases the information in these publications is modified or rearranged at the state or local level and then printed or copied locally for their specific needs. This kind of multiplying effect is quite extensive and becomes a very significant factor in the utilization of other agency's publications by the Extension system. Unfortunately, we have no way of gathering those statistics.

o Memorandum of Understanding (MOU) Between Extension Service and Human Nutrition Information Service

A MOU between ES and HNIS was prepared to clarify the intentions of the two agencies to work together in achieving their common goals in nutrition education. A panel of Cooperative Extension Service nutrition educators in the States is being formed to advise HNIS/ES staff concerning future nutrition education information needs.

C. Coordination With the Private Sector

o The National Healthy Mothers, Healthy Babies Coalition

In 1981 the National Healthy Mothers, Healthy Babies Coalition was formed to support the cause of healthier mothers and infants. Today, the Coalition consists of 85 national voluntary, professional and governmental organizations committed to improving maternal and infant health through public education. As a member of the Coalition, Food and Nutrition Service staff actively participate on the Steering Committee, Subcommittee on Breastfeeding Promotion, Adolescent Pregnancy Subcommittee, Substance Use Subcommittee, and the Low-Income Women Subcommittee.

The Coalition provides a mechanism for individuals and organizations to share ideas for improving maternal and infant health. The Coalition avoids advocating any particular position or issue, thus offering a neutral meeting

Table 7

USDA Agency Publications Used by Extension System
(1985-present)

Agency/Publication	Number Distributed*
Food Safety and Inspection Service (FSIS)	
Safe Food Book	97,212
Safe Food to Go	39,315
Talking About Turkey	79,265
Food News for Consumers (quarterly)	710/qtr**
Meat and Poultry Labels--Wrap it Up	5,000 (initial mailing)

**Some Extension staff subscribe directly with FSIS for this publication. Total number used by Extension staff is actually higher.

Agency/Publication	Number Distributed*
Human Nutrition Information Service (HNIS)	
Dietary Guidelines and Your Health	5,000 distributed with 63,000 cost-shared
Dietary Guidelines	5,000 distributed with 465,000 cost-shared and camera-ready copy distributed for reproduction
Dietary Guidelines (Spanish)	5,000 plus
Nutritive Value of Foods	5,000 distributed with 52,000 cost-shared
Composition of Foods (Updates)	225
Nationwide Food and Consumption Survey-Continuing Survey of Food Intakes by Individuals-CSFII	125
Economic Research Service (ERS)	
National Food Review (quarterly)	2,400 + cost-shared/qtr.
Agricultural Outlook Speeches	distribution varies, but at least to all state leaders
Agriculture Chart Book	5,000
Food Costs from Farm to Retail	5,000
Food Marketing Review (annual)	250
Food Security Act of 1985	1,000
U.S. Demand for Food, Households	140
Agricultural Research Service (ARS)	
Family Economics Review (quarterly)	2,000/issue
Nutrition Research Brief (monthly)	200 +
Food and Nutrition Service (FNS)	
Making Your Food Dollars Count (flyer)	300,000 (distributed
Making Your Food Dollars Count (booklet)	500,000 through the
Thrifty Meals for Two	500 EFNEP program)

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*Number distributed through Extension only. Actual distribution number to Extension staff may be higher.

ground for organizations with divergent opinions on some maternal and infant health issues. FNS involvement in coalition activities has benefited FNS' WIC and Commodity Supplemental Feeding programs by facilitating interaction with health care providers at the national and state levels who in turn have assisted in identifying and referring high-risk participants to FNS programs.

- Workshop on Industry Research Needs

A workshop was held at the Beltsville Human Nutrition Research Center in June to exchange information with industry on lipid research findings and to identify those research questions related to dietary fat and of importance to industry. Participants included representatives of the soybean, cottonseed, red meat, poultry, dairy and processed food industries. It was agreed that more information was needed about the ideal makeup of fatty acids in the total diet in order for each commodity group to better know how to modify their products to improve the quality of the food supply even at lower levels of fat intake.

- Marketing Promotion Expanded

Industry financed research and promotion programs for beef, pork, and honey were initiated in October and November 1986, and in February 1987, respectively. These programs, along with those for potatoes, eggs, and dairy, are authorized by Federal statute and fall under AMS' oversight responsibility.

- National Dairy Promotion and Research Board and an Extension Advisory Group

The National Dairy Promotion and Research Board and an Extension advisory group assisted with the development of a package of educational materials entitled "Calcium for the Prime of Life," for Extension use. Release of the videotape and supporting materials is scheduled for early 1988. This project illustrates the growing recognition of nutrition education as an integral part of making American agriculture profitable and productive, and it indicates that industry recognizes the wealth of expertise within the Extension system.

- Human Nutrition Information Coordinating Team

The Human Nutrition Information Coordinating Team has been investigating various methods and opportunities for cooperative programs in publishing and developing nutrition information materials with the private sector or other governmental groups. Currently, the Team is working with the Consumer Information Center (CIC) in developing ideas for multiagency coordinated information materials that could be presented by the CIC to private sector and other governmental agencies for possible cooperative publishing. Also, at the Team's suggestion, a program on cooperative publishing was presented at a regular meeting of the USDA Public Affairs Council (PAC). The PAC consists of USDA agency directors of information, their deputies, and other staff members responsible for disseminating public information.

- Wellness in the Worksite

In 1982, the U.S. spent more than $320 billion for health care. This is more than 10 percent of our gross national product. Each year, 500 million workdays are lost due to illness or disability--26 million due to heart disease and hypertension; 93 million due to lower back problems. Employer health care costs are rising at the rate of 25 to 100 percent a year--an estimated 25 percent of total payroll for health care. USDA Food and Fitness program joined forces with the nation's life and health insurance industry in developing a manual which promotes worksite wellness. The purpose of the manual is to assist employers in developing and implementing worksite wellness programs for employees at all levels. Suggestions and resources are given for program implementation so that employees can control the major risk factors such as smoking, high blood pressure, blood cholesterol levels, and diabetes. Other factors that employees can control are obesity, lack of exercise, and stress. Copies were made available to all county Extension offices to promote its use in their local areas. USDA has received over 2,000 requests for the manual as a result of a press release that has been picked up by all the major U.S. newspapers. All USDA agencies have received copies of the manual and FmHA has used the manual in all their State and county offices for their employees wellness program.

D. Advisory Groups

1. Human Nutrition Board of Scientific Counselors (HNBSC)

The HNBSC has developed several recommendations for the Secretary regarding the Department's nutrition education efforts. These are:

- The nutrition education programs of the Department should provide consistent, accurate, clear, concise, and useful information to help consumers make informed food choices. This information will also assist the food industry.

- The U.S. Dietary Guidelines should be used as the basis for developing all nutrition education programs conducted by the Department. The Department should, whenever necessary, target this information to selected groups. Coordination and communication with the Human Nutrition Information Service and Extension nutrition specialists should be improved.

- The educational materials developed by the Human Nutrition Information Service should meet the needs of the Extension Service. The organizational structure makes this difficult, but the Committee believes such coordinated effort is absolutely essential.

- Nutrition education specialists in Extension should be integrated as faculty members in academic departments at land grant institutions. This will facilitate the dissemination of information and enhance specialists' expertise.

- The Department should increase nutrition expertise at the Federal level to provide appropriate leadership for fostering and enhancing federal coordination with state and county programs.

- Centers of Excellence in Extension nutrition should be implemented within institutions that have strong nutrition programs. These centers should also provide opportunities for fellowships in nutrition education. The Task Group recognizes that implementation of these recommendations may require retention of more funds at the Federal level.

In addition, the HNBSC expressed their concurrence with all of the recommendations contained in the report "Food and Nutrition: The Link Between Health and Agriculture--Directions for the Cooperative Extension Program, Cornell University, 1987, Ithaca, New York."

2. FNS' Advisory Councils

FNS' two advisory councils, the National Advisory Council on Child Nutrition (NACOCN) and the National Advisory Council on Maternal, Infant and Fetal Nutrition (NACMIFN), meet biennially to determine how program administration and operations can be improved. Descriptions of the councils and their activities were included in the first USDA Human Nutrition Research Report to Congress.

3. Extension Service's Expert Advisory Panel

The Expert Advisory Panel convened by the Extension Service to explore the opportunities in food and nutrition education and to make recommendations for future directions in extension education completed its task. Their report suggests several new initiatives, including (1) designate Centers of Excellence, (2) increase visable research linkages, (3) initiate issue-oriented exchanges, (4) expand and revitalize the nutrition education network and (5) strengthen USDA's nutrition education efforts.

The Cooperative Extension system intends to redefine and refocus its food and nutrition efforts. It reaches into every state and 3,150 counties in the United States. The nation's rapidly changing demographic picture presents a major challenge to nutrition educators and to the food system. Today the scientific community recognizes that health can be affected by dietary components that are not necessarily essential nutrients. The Panel's report is entitled "Food and Nutrition. The Link Between Health and Agriculture. Directions for the Cooperative Extension System" and was produced cooperatively by the Extension Committee on Organization and Policy, Extension Service, USDA and Cornell Cooperative Extension.

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